

OPTIONS





LAGGING FOR STANDARD BELTS

Smooth or specially grooved lagging to increase friction between the shell and conveyor belt

Product description

Characteristics

- High resistance to oil, fuel and other chemicals
- Increases friction between the shell of the drum motor and conveyor belt
- Prevents slip between the shell of the drum motor and conveyor belt
- Longitudinal grooved lagging reduces liquid build up between belt and shell
- Centered V-groove for belt tracking
- Multiple V-grooves for V-belt or round belt conveyors

Applications

- Wet applications
- For standard drum motors
- Food and hygienic applications
- Flat belt, round belt or multi V-belt applications
- Hot vulcanisation for high-torque drum motors

Note: The Lagging influences the outer diameter of the drum motor and increases its speed to that stated in the catalogue. The tangential force and the speed of the drum motor must be recalculated according to the increased diameter.

COLD BONDED LAGGING (R)

Lagging profile	Colour	Characteristics	Shore Hardness	Thickness mm
Smooth (S)	Black (B)	Oil and Fat resistant	60 ± 5 shore	3, 5, 6, 8, 10, 12
	White (WH)	In compliance with following food contact regulations: EC 1935/2004 and FDA 21 CFR		
Longitudinal grooves (Ri)	White (WH)	In compliance with following food contact regulations: EC 1935/2004 and FDA 21 CFR		8
Diamond pattern (DP)	Black (B)	Oil and Fat resistant		8

HOT VULCANIZATION LAGGING (VR OR XN)

Lagging profile	Colour	Characteristics	Shore Hardness	Thickness mm
Smooth (S)	Black (B)	Oil and Fat resistant	65 ± 5 shore	4 mm standard 6, 8, 10, 12
	White (WH)	In compliance with following food contact regulations: EC 1935/2004 and FDA 21 CFR		
	Blue (BL)	In compliance with following food contact regulations: EC 1935/2004 and FDA 21 CFR		
Modular belting (M)	White (WH)	In compliance with following food contact regulations: EC 1935/2004 and FDA 21 CFR		6, 8, 10, 12, 14
	Blue (BL)	In compliance with following food contact regulations: EC 1935/2004 and FDA 21 CFR		
Diamond Patterned (DP)	Black (B)	Oil and Fat resistant		6, 8

For a short description of the type of lagging.

Example:

R3 / S - W

| | | White
 | | | Smooth
 | | | 3mm thickness
 | | | Cold Vulcanisation

LAGGING FOR STANDARD BELTS

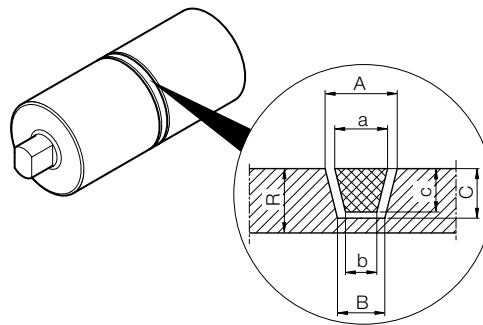
V-groove section - Smooth and specially grooved lagging to increase friction between the shell and conveyor belt

V-groove

Hot Vulcanization

A machined centre groove in the hot vulcanized rubber coating, allows the use of conveyor belts manufactured with a tracking profile on the underside of the belt. Designed to help maintain tracking and to prevent belt wander. Conveyors using this type of belt should be designed in such a way that the slider bed or roller bed primarily tracks the belt and not the drum motor.

Fig.: V-grooved lagging



Groove	R Standard mm	R Stainless steel	Groove			Belt		
			A	B	C	a	b	c
K6	8	5	10	8	5	6	4	4
K8	8	6	12	8	6	8	5	5
K10	10	8	14	10	7/8*	10	6	6
K13	12	10	17	11	9/10*	13	7.5	8
K15	12	10	19	13	9/10*	15	9.5	8
K17	14	12	21	13	12	17	9.5	11

* for shell in stainless steel.

All dimensions are expressed in mm.

Rule:

- 1) R-C ≥ 2 for shell in steel
- 2) R=C for shell in stainless steel

Example for the groove description:

Central Groove K6

or for non standard measures:

Groove 11/8 x 5 Central
A/B x C

PROFILED LAGGING FOR PLASTIC MODULAR BELTS

Specially produced lagging, profiled to suit the belt manufacturers series of plastic modular belt

Product description

Characteristics

- Resistance to abrasion
- Low noise during operation
- Reduced wear of the belt
- Easy to clean
- High resistance to oil, grease and chemicals applications

Applications

- Applications for food environments
- Profiles to suit most manufacturer's standard plastic modular belts
- Drum motor with de-rated motors
- For standard drum motor with frequency converters. The frequency converter must be prepared to reduce the power by 18%

Note: The Lagging influences the outer diameter of the drum motor and increases its speed to that stated in the catalogue. The tangential force and the speed of the drum motor must be recalculated according to the increased diameter.

TECHNICAL DATA

Material	Hot Vulcanized nitrile rubber NBR
Lagging temperature	-40 /+120 °C (consider the temperature allowed for the drum motor)
Shore Hardness	From 65 to 70 ± 5 Shore A

Plastic modular belts manufacturer	Type Series	80LS	113LS	138LS	165LS
		Z	Z	Z	Z
Scanbelt	S.25 - 800		16	20	
	S.25 - 801		9		
	S.50 - 100 & 600			11	
	S.50 - 800		9	11	
Intralox	800		9	10	12
	1100 FG PE/AC	20	27		
	1100 FG PP		26		
	1100 FT PP		27		38
	1100 FT PE/AC	20	26	32	
			27		
1600	13	16	20	23	
Ammeraal/Uni-Chains	HDS62000		9	10	
	S-MPB	12	16	20	
				21	
	CNB		16	20	
	UNI QNB		16		
MPB/ECB		9	10	12	
Forbo Siegling	Series 6.1		9	10	13
				11	
HABASIT	M1220	24			
	M2510	12	16		23
	M5010		9	10	12

SPROCKETS FOR PLASTIC MODULAR BELTS

Special laser cut sprockets based on the specification of modular belt manufacturers

Product description

Characteristics

- Laser cut for excellent fitting accuracy
- Stainless steel sprockets to avoid rust
- Low friction

Applications

- For the control of plastic modular belts
- For standard drum motors with frequency converters. The frequency converter should be prepared to reduce the power by 18%
- For drum motors with de-rated motor
- For drum motors with cylindrical shell and locking key
- For food processing applications

Note: The Sprockets influence the outer diameter of the drum motor and increases its speed to that stated in the catalogue. The tangential force and the speed of the drum motor must be recalculated according to the increased diameter. Please refer to the velocity factor (Vf) in the table below.

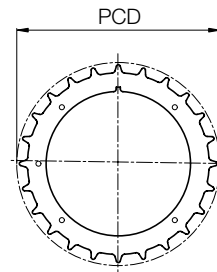
Characteristics

Different belt variants and materials may affect the operational characteristics. Rulmeca try to show the most popular basic profile options in this catalogue. If you are unable to find the required profiled lagging or sprocket you need, or if you have some doubts, please answer the following questions and send them to Rulmeca with your enquiry:

- Lagging or sprockets preferred?
- Thermoplastic non-modular belt or plastic modular belt?
- drum motor diameter?
- Required belt speed?
- Belt manufacturer?
- Belt series?
- Belt type and variant?
- Belt material?
- Number of teeth?
- Tooth Pitch?
- Reversible, yes or no?
- Outside diameter (D) in mm?
- Pitch circle diameter (PCD) in mm?
- Sprocket thickness (B) in mm?

Product description

Drum motor that require sprockets, must be ordered with a cylindrical shell.



- Z** Number of teeth
- PCD** Pitch circle diameter in mm
- Vf** Velocity factor
- B** Width of sprocket in mm
- Rev.** Reversible sprocket
- Ref. no.** Reference number

Modular belt manufacturer	Series	Sprocket 80LS				113LS				Sprocket 138LS				165LS			
		Z	PCD mm	Vf	B mm	Z	PCD mm	Vf	B mm	Z	PCD mm	Vf	B mm	Z	PCD mm	Vf	B mm
Intralox	800	8	133.00	1.63	6.00	10	164.00	1.45	6.00								
	1100	24	116.00	1.42	18.00												
		24	116.00	1.42	6.00												
	1600	14	114.00	1.40	8.00												
	2400	15	122.00	1.49	6.00	19	154.00	1.36	6.00	24	195.00	1.42	6.00	26	211.00	1.30	6.00
HabasitLINK	M1220	25	101.00	1.24	3.00												
	M2520 & M2530	15	122.00	1.49	12.00												
		15	122.00	1.49	4.00	20	164.00	1.45	4.00								
Uni Chains / Ammeraal	Flex SNB	14	114.00	1.40	3.00	18	146.00	1.29	3.00	21	170.00	1.24	3.00	24	195.00	1.20	3.00
	M-SNB & M-QNB	24	97.00	1.19	5.00												

BACKSTOP / ANTI RUN-BACK BEARING

Product description

Backstops prevent the roll-back of the belt and carried load in case of shutdown or lack of power supply.

Characteristics

- The backstop runs only in one direction
- Mounted on the rotor shaft, except for the 80LS
- Mounted in the end housing on the 80LS
- No need for an electrical connection
- Higher holding torque than an electromagnetic brake

Applications

- Single direction inclined belt conveyors
- For preventing run-back of the belt and load when the power supply is off

The rotational direction of the drum motor with backstop is indicated by an arrow on the end housing at the electrical connection side.

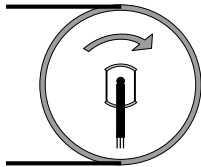


Fig.: Rotation arrow.

Product range

- Rotation direction from the electrical connector side
- Clockwise Anti-Clockwise

ELECTROMAGNETIC BRAKES

Product description

The Electromagnetic brake stops and holds the load in position according to the stated holding torque.

Characteristics

- Low noise
- Wear contained
- Powered by a separate external rectifier
- Applied directly on the rotor of the drum motor
- When the power to the motor is lost or stopped the brake will close (mechanically engage)

Applications

- For reversible inclined and declined conveyors
- For reduced stopping times*
- For stopping and holding loads
- For approximate positioning

(* For faster stopping times and accurate positioning, please use a frequency converter with braking function and if necessary an encoder with feedback control.

Response time

The response time for opening of the brake (drum motor start) and closing (stop drum motor), may vary substantially according to:

- Type and viscosity of the oil
- Level of oil in the drum motor
- Ambient temperature
- Internal motor working temperature
- Switching at input (AC-switching) or at output (DC-switching)
- Control contact of the coil brake into the alternating current supply of the rectifier (long response times), or on the output DC of the rectifier (fast response)
- Type and output voltage of the rectifier control of the brake coil

The difference between the control in alternating current and direct current is shown in the following table:

	AC Switching	DC Switching
Intervention time	Slow	Fast
Braking voltage	Nearly 1Volt	Nearly 500volt

Note: For the brake coil command in DC, the contacts must be protected against surges.

Reduction of braking torque

The declared braking torque M , is strongly influenced by the operating conditions of the drum motor (with oil at high temperatures) and the ambient temperature. For the calculation of the load that can be braked in safety, the braking torque provided in the tables should be reduced by 50%.

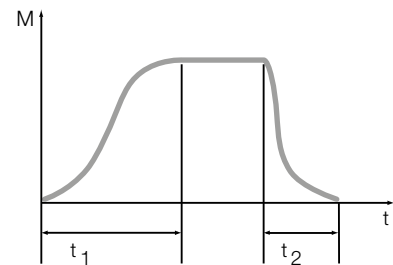


Fig.: Time t/Torque M brake closure

- t_1 Closing response time (de-excitation coil): Stop
- t_2 Opening response time (excitation coil): start

ELECTROMAGNETIC BRAKES

PRODUCT RANGE							
Drum motor	Rated torque M (Nm)	Rated power (W)	Rated voltage (V CC)	Rated current (A)	DC switching t1 (ms)	AC switching t1 (ms)	Opening delay time t2 (start) (ms)
80LS	1.1	12	24	0.5	13	80	20
			104	0.12	13	80	20
113LS 138LS	6	24	24	1.00	26	200	30
			104	0.23	26	200	30
			207	0.12	26	200	30
165LS	12	33	24	1.38	46	260	40
			104	0.32	46	260	40
			207	0.16	46	260	40

RECTIFIERS

The rectifier operates the electromagnetic brake

Product description

Characteristics

- The Rectifier for the electromagnetic brake (external component), must be installed in a protective box as close as possible to the drum motor

Applications

- Drum motor with electromagnetic brake
- Frequent start and stop applications
- Positioning applications
- Half-wave rectifier for standard applications
- Fast acting and multiswitch rectifier for applications in which short opening delay times are necessary

PRODUCT RANGE

Input Voltage V AC	Brake voltage V DC	Starting voltage V DC	Holding voltage V DC	Rectifier type	Application
115	104	104	52	Fast acting rectifier	C L
230	207	207	104	Fast acting rectifier	C L
230	104	207	104	Fast acting rectifier	CS
230	104	190	52	Phase rectifier	CSL
230	104	104	104	Half wave rectifier	C
400	104	180	104	Multiswitch rectifier	C S
460	104	180	104	Multiswitch rectifier	C
460	207	207	207	Half wave rectifier	C

- C** Continuous running application
S Frequent start/stop application
L Less heat*

* Using a fast acting rectifier or a phase rectifier will save energy and the brake coil heats up less. These types of rectifiers generate a holding voltage lower than the starting voltage of the brake coil itself.

General rules for voltages of rectifiers

One way / Half wave rectifier:

- Output DC voltage = 0.45 x input AC voltage

Fast acting rectifier:

- 1. Bridge rectifier: output DC voltage = 0.9 x input AC voltage for 0.004- 2 s (overexcitation time influenced by external resistance)
- 2. One way rectifier: output DC voltage = 0.45 x input AC voltage

Phase rectifier: - input 230 VAC (only for 104 VDC brakes)

- 1. Overexcitation voltage 190 VDC for 0.15 sec fixed
- 2. Holding brake voltage 52 VDC (50% of the brake voltage is enough to keep the brake open)

ENCODER SKF BEARING

Product description

Characteristics

- Supplies low resolution signals to an external control unit
- Embedded in the rotor bearing
- Cannot be combined with the electromagnetic brake option

Applications

- For applications which require the continuous control of the speed, direction, and position of the drum motor belt or load

TECHNICAL DATA

Rated voltage	From 5 to 24 V
Max.operated current	From 8 to 10 mA
Max.output current	20 mA
High level Voltage	> 3.5 V
Low level voltage	< 0.1 V

INC resolution

The INC resolution (n° of increments per pulley revolution) depends on encoder type and can be calculated as follows:

$$INC = Z \times i$$

i Gear ratio of the drum motor

Z Number of encoder increments per rotor revolution

PRODUCT RANGE

Drum motor	From 5 to 24 V	Increments for rotor revolution
From 80LS to 138LS	6202	32
165LS	6205	48

Note: The drum motor 80LS with encoder has 2 cables-one exiting through each shaft at either end.

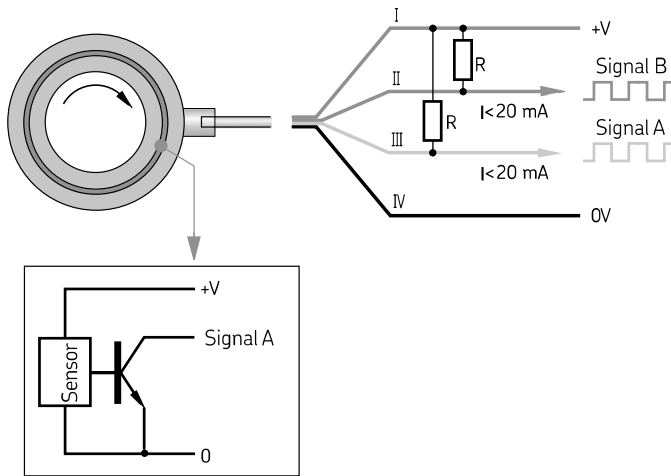
Control interface

The encoder has open collector NPN transistor outputs. When connected to the input of a control interface the required load resistances (R) have to be used. The load resistances are stated in the table overleaf. When using different interfaces or, should you have any doubts, please refer to Rulmeca or to a local electronic specialist.

Rulmeca recommends the use of an Opto-coupler for the following reasons:

- To protect the encoder
- To enable connection to other levels such as PNP
- To get the maximum potential between high and low signal

ENCODER SKF



Voltage +V DC	Load Resistances R Ω
5	270
9	470
12	680
24	1500

ENCODER RLS

Product description

Characteristics

- Supplies high resolution signals to an external decoder and control unit
- Embedded in the rotor bearing
- Cannot be combined with an electromagnetic brake

Applications

- For applications which require control of speed, direction, and position of the drum motor belt or load

INC resolution

The INC resolution (n° of increments per pulley revolution) depends on encoder type and can be calculated as follows:

$$INC = Z \times i$$

i Gear ratio of the drum motor

Z Number of encoder increments per rotor revolution

PRODUCT RANGE

Drum motor	Encoder type	Rated voltage V DC	Max. operating current mA	Max.cable length m	Precision °
80LS - 320H	RS422A 5V	5	50	5	0.5

Note: Other resolutions are available on request.

ENCODER RLS

Data sheet
RM44D01_04
RM44IC - Incremental, RS422A, 5V
Alternative for optical encoders

TECHNICAL DATA

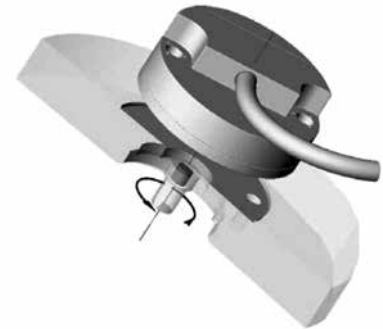
Power supply	$V_{dd} = 5\text{ V} \pm 5\%$
Power consumption	35 mA
Output signals	A, B, Z, A-, B-, Z- (RS422A)
Max cable length	5 m
Operating temperature	- 25 °C to +85 °C
Ext. operat. temp.	- 40 °C to +125 °C (IP64)
Edge separation	1 μs minimum

Pulses per rev	Resolution options (counts per rev)	Maximum speed (rpm)	Accuracy	Hysteresis
256	1024	20000	$\pm 0.5^\circ$	0.18°
1024	4096	5000	$\pm 0.5^\circ$	0.18°

* Worst case within operational parameters including magnet position and temperature.

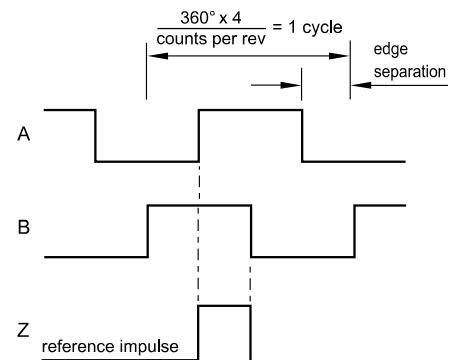
CONNECTIONS

Pin Nr.	Function	Wire colour
1	Shield	-
2	Z	White
3	B	Green
4	A	Grey
5	VDD	Red
6	Z-	Brown
7	B-	Yellow
8	A-	Pink
9	GND	Blue



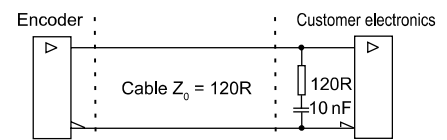
Timing diagram

(complementary signals not shown)



B leads A for clockwise rotation of magnetic actuator.

Recommended signal termination



ACCESSORIES



MOUNTING BRACKETS FOR DRUM MOTOR AND IDLER

PRODUCT RANGE

Drum motor	Type	Material	D (mm)	F (mm)	I (mm)	K (mm)	S (mm)	T (mm)	V (mm)	W1 (mm)	X (mm)	X1 (mm)	Z (mm)	Z1 (mm)	Thread	Weight [kg]
80LS	KL 20	Aluminium	20	14	57	38	6.5	9	12	10	72	103	35	55	M6	0.14
113LS	KL 25	Aluminium	25	20	85	55	8.5	11	15	20	110	150	42	66	M6	0.51
138LS	KL 30-A	Aluminium	30	20	89	55	8.5	11	15	20	110	150	44.5	71	M6	0.54
165LS-320M	KL 41-HD	Steel with black powder coat	40	30	84	62	14	20	22	40	110	190	50	83	M8	2.1
165LS-320M	KL 41-S/S	Stainless steel	40	30	84	62	14	20	22	40	110	190	50	83	M8	1.9
320H	KL 42	Steel with black powder coat	50	40	121	90	18	30	25	50	150	250	70	110	M8	4.5

