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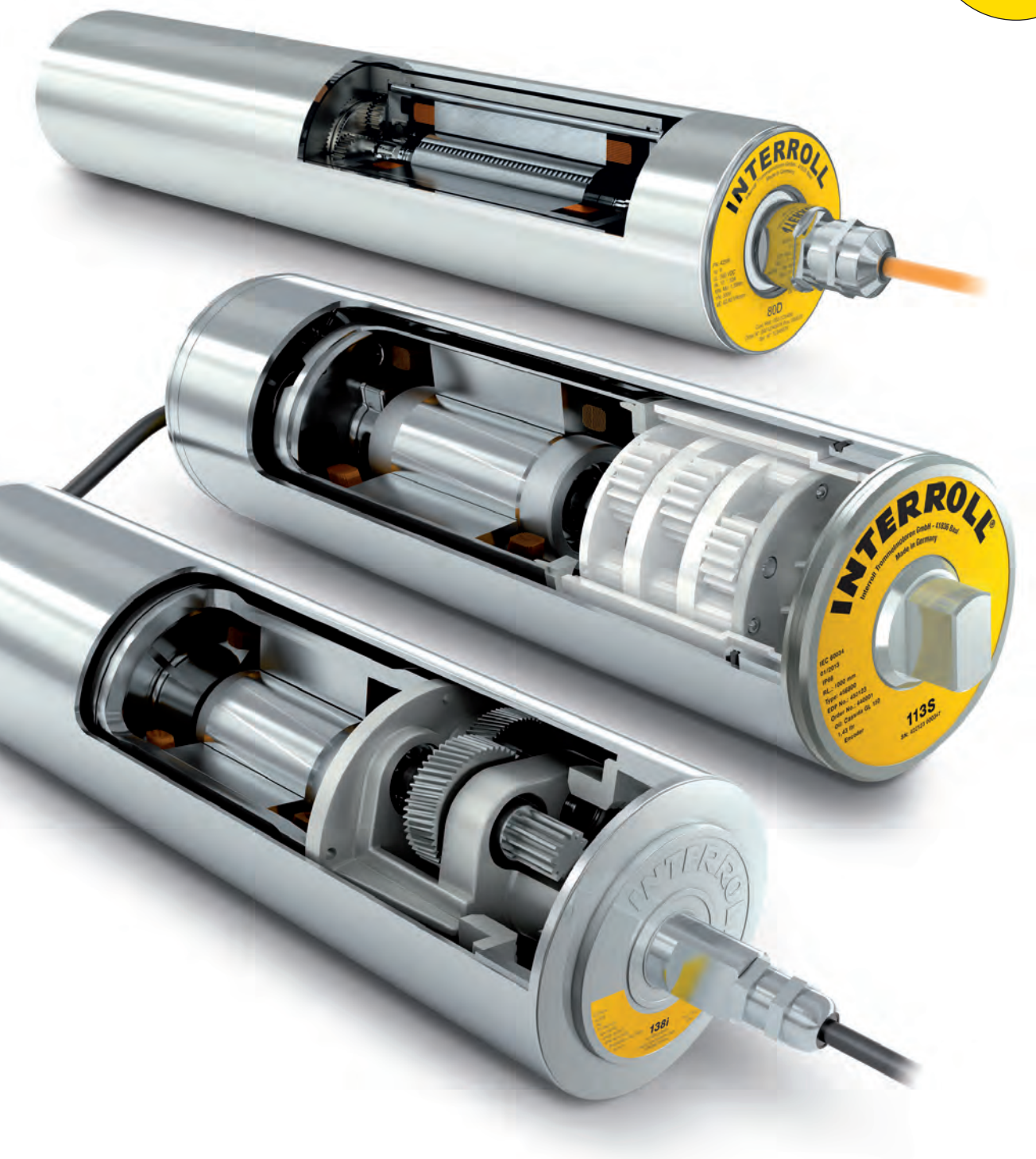

DRUM MOTORS

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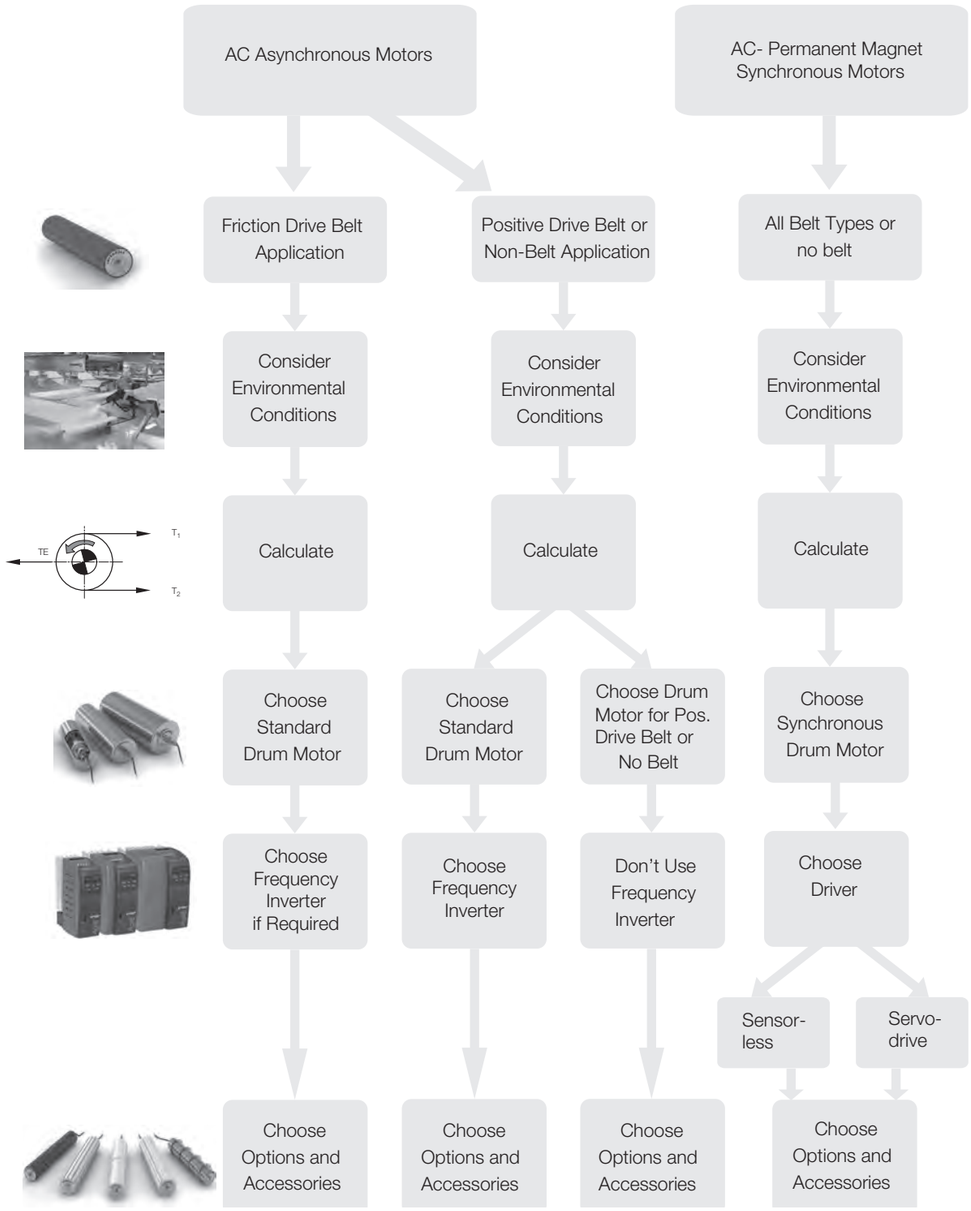
Which drum motor is suitable for your application?



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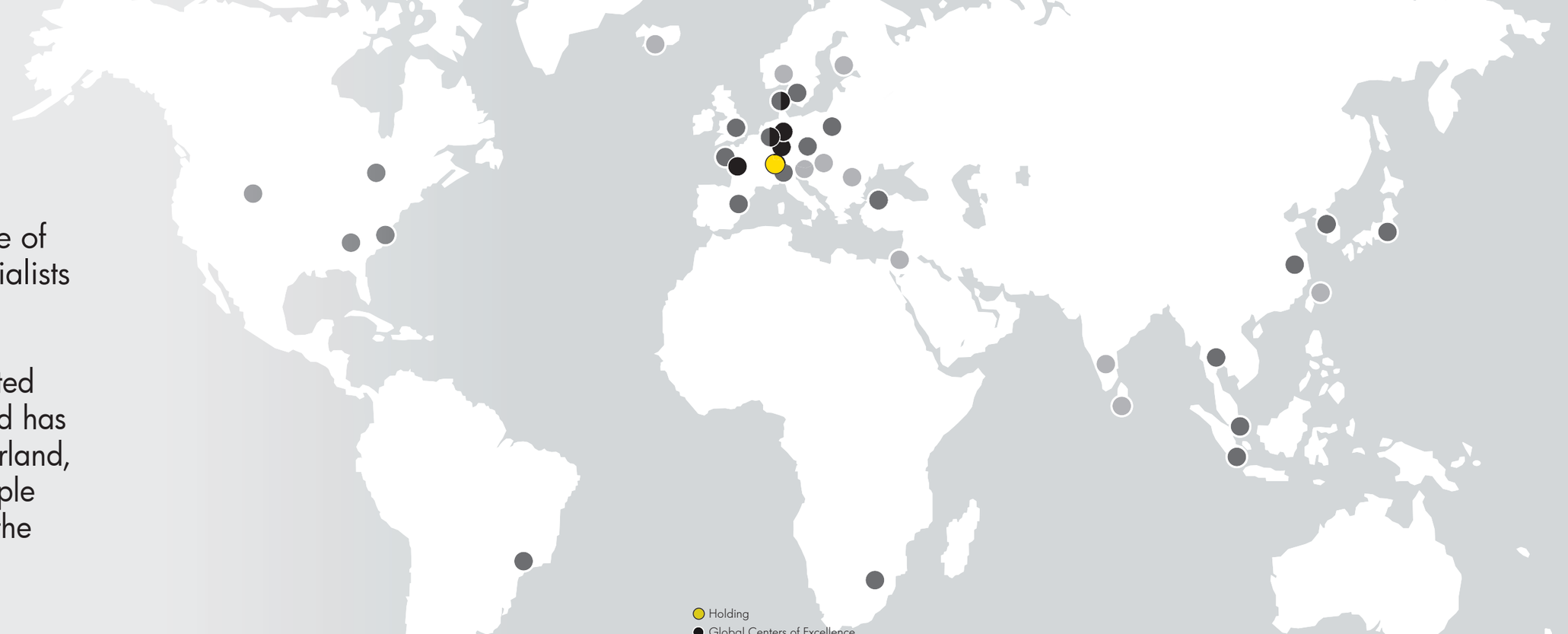
The Worldwide Interroll Group

The Interroll Group is one of the world's leading specialists for in-house logistics.

The company, which is listed on the stock exchange and has its headquarters in Switzerland, employs some 2,000 people in 32 companies around the globe.



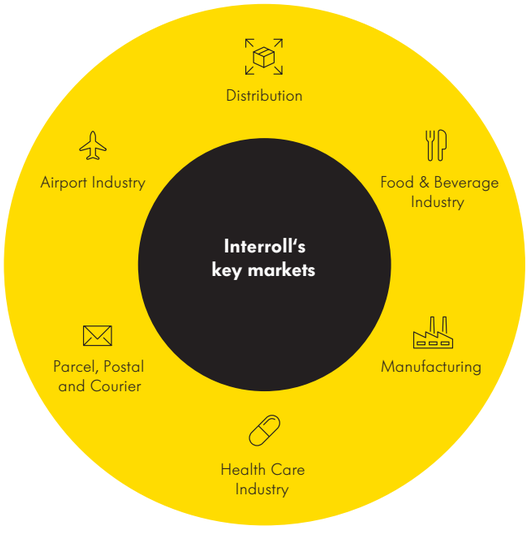
Our products can be found primarily in the food industry, in airport logistics, in the parcel, postal and courier sector, in distribution, and in various branches of the industry. This includes: Easy-to-integrate drive solutions such as drum motors for belt conveyors; conveyor rollers and DC drive rollers for roller conveyors; flow storage modules for compact pallet and container storage in distribution centers; crossbelt sorters, belt curves and other user-friendly conveyor modules for cost-efficient material flow systems.

With the acquisition of Portec in 2013, Interroll increases its customer presence and offers a greater product range in the airport and package sectors.

Among the overall 23,000 Interroll customers are plant constructors, system integrators and equipment manufacturers. Our products are in daily use at brands know throughout the world, such as Amazon, Bosch, Coca-Cola, Coop, DHL, Procter & Gamble, Siemens, Walmart, Yamaha, and Zalando.

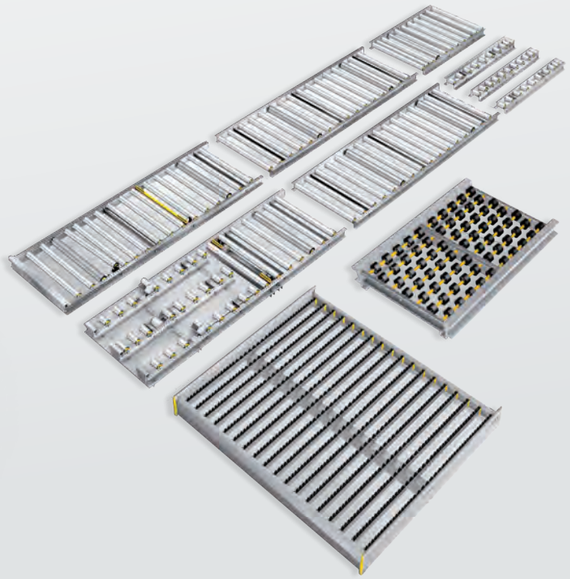
Regional centers of excellence and production, global knowhow, financial stability and a solid market reputation make Interroll the strong business partner and attractive employer.

Furthermore, Interroll initiates global research projects in the area of logistics efficiency and actively supports industry associations in the development of standards and in the more efficient utilization of resources.



The Heart of In-House Logistics

With an experienced eye for the big picture, we offer you the kind of products that are versatile and essential building blocks in the portfolio of any successful planner or developer.



Conveying

Versatile and reliable core products ensure a dynamic, efficient material flow across all continents and in all sectors:

- Conveyor rollers
- Drum motors and return rollers
- 24 V DC Drives (RollerDrives)
- Controllers for RollerDrive and drum motors

They are used to convey, accumulate, feed or remove goods. Powered or with gravity. With or without accumulation pressure. Easy to install drive solutions for new plants or to refurbish existing plants. Excellent products that will pay for themselves and that you can rely on. In every respect.

Transporting and Distributing

Millions of different individual items travel through the world's flow of goods every day and must be delivered on time to the correct destination. This is a trend that requires a performance- based logistics system with efficient material flow solutions. Interroll's innovative conveyor modules and subsystems are always ready for key locations in customers' systems:

- Crossbelt sorters
- Belt curves and belt merges
- Conveyor modules with zero-pressure accumulation
- Roller conveyors
- Belt conveyors

Precisely pre-assembled and rapidly delivered for fast, simple integration into the complete system on site (plug and play). The conveyor modules and subsystems provide users with key assurances: excellent availability whilst being easy to use; outstanding efficiency even at low throughput volumes; efficient investment with a short period of return on investment; adaptability in the event of change.

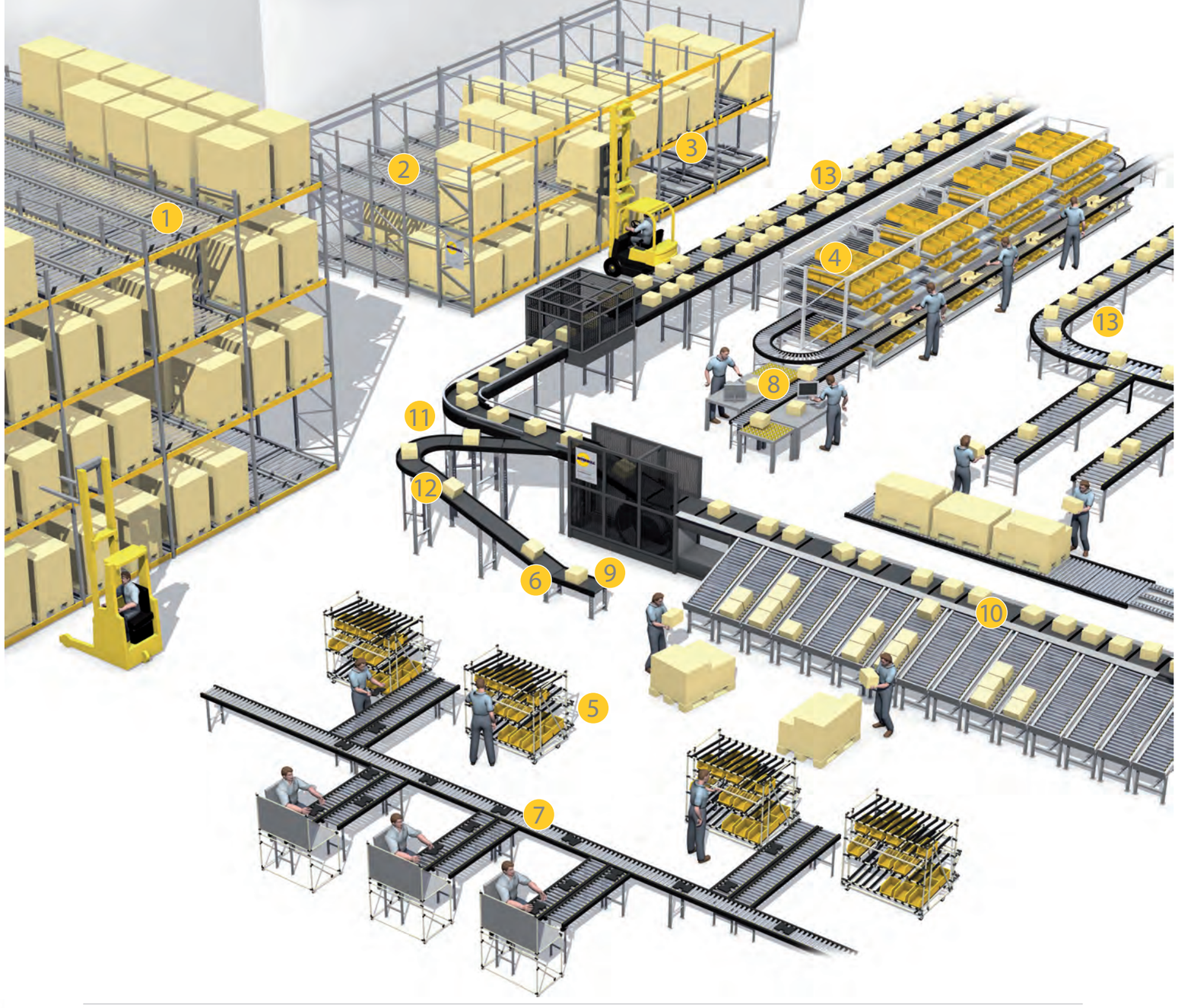
Storage and Picking

Economical and user-friendly: the dynamic storage solution that operates without energy. It is designed for fast-moving goods (e.g. groceries) that have to be picked and quickly conveyed to consumers. The principle is as simple as it is ingenious. It is known as FIFO, First in – First out, and guarantees that what has been stored first is also picked first. Or LIFO, Last in – First out, when what has been stored last is picked first. It means making maximum use of minimum space. And because the needs of our customers are as diverse as their products, our central and peripheral subsystems offer unlimited design options.

- Pallet Flow
- Carton Flow

The picking times can scarcely be beaten. The return on investment for the operator is two to three years and is integrated into "Just in Time".

INTERROLL – THE MOST GLOBAL PROVIDER OF KEY PRODUCTS FOR MATERIAL HANDLING SOLUTIONS



① FIFO - Pallet flow storage modules (Conveyor Rollers)
② LIFO - Pallet flow storage modules (Conveyor Rollers)
③ LIFO - Pallet flow storage modules (Cart Pushback)
④ Order picking racking with Carton Flow (Roller Track)
⑤ Order picking racking with Flex Flow

⑥ Drum Motors, Idler Pulleys, brackets
⑦ 24 V DC RollerDrives and Controls
⑧ Conveyor Rollers and Accessories
⑨ Idler Pulleys

⑩ Crossbelt Sorters
⑪ Belt Curves
⑫ Belt Conveyor Modules
⑬ Conveyor Modules for zero pressure accumulation (ZPA) Conveyors

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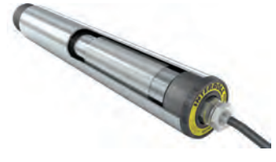
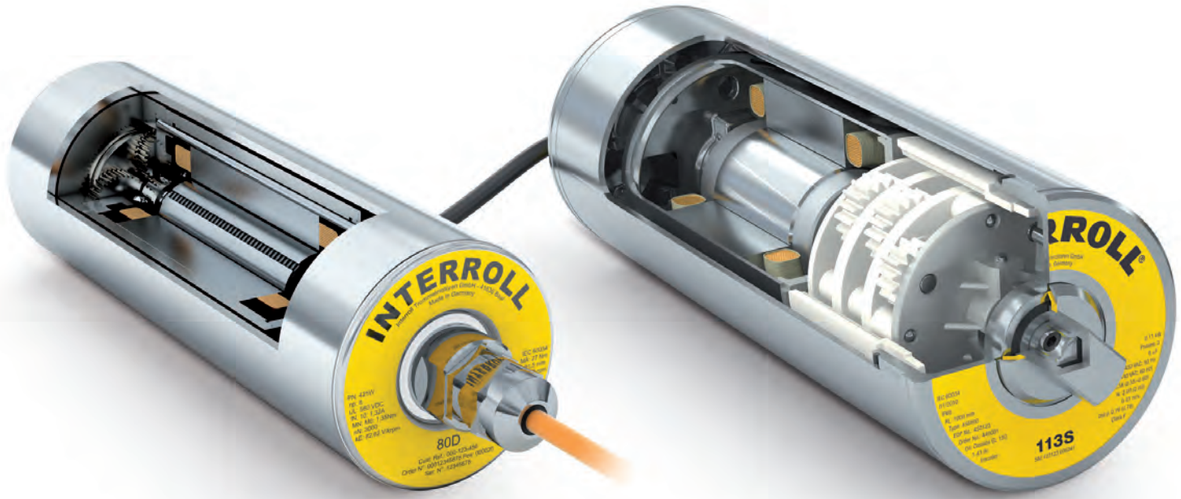
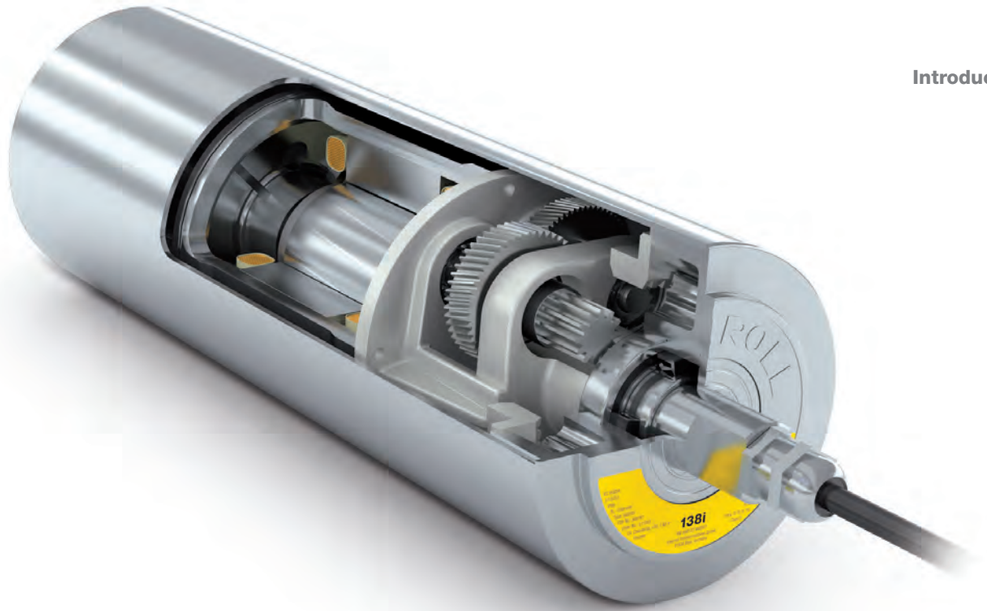
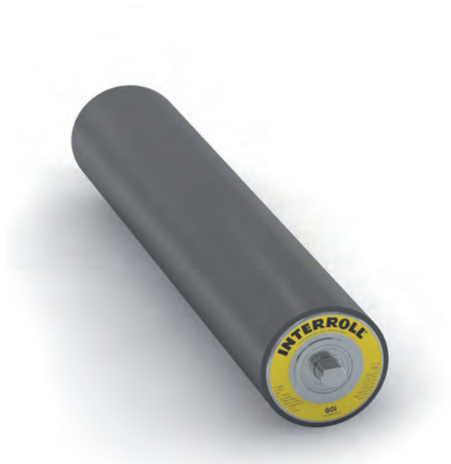






INTRODUCTION TO INTERROLL DRUM MOTORS

- ✓ **Plug and play** — Interroll Drum Motors are much quicker and easier to install than conventional drive systems, requiring less than a quarter of the time needed to fit a multi-component drive. Fewer parts mean reduced costs for conveyor design and purchasing of parts.
- ✓ **Hard-wearing** — Interroll Drum Motors will keep operating at 100 % even in harmful environmental conditions, such as water, dust, grit, chemicals, grease, oil and even during high pressure wash-down procedures.
- ✓ **Hygienic design** — Due to the smooth, stainless steel finish and the hermetically sealed and totally enclosed design, Interroll Drum Motors are much easier to clean and therefore reduce the risk of contamination in food processing.
- ✓ **Energy efficient** — Our asynchronous drum motors have an efficiency up to 78 % and our synchronous drum motors up to 83 %.
- ✓ **Space-saving** — Because the motor, gearbox and bearings are mounted within the drum shell, the drum motor takes up much less space.
- ✓ **Safe** — As a self-contained component without protruding parts and with fixed external shafts, an Interroll Drum Motor is probably the safest drive unit available for state-of-the-art material handling equipment.
- ✓ **Maintenance-free** — The totally enclosed hermetically sealed design ensures, that the internal parts are unaffected by external conditions and maintains trouble free operation for all kinds of applications.
- ✓ **New technology** — The synchronous drum motor is an energy-efficient drive system. The D-Series product range offers high dynamic torque performance and an eco-friendly energy saving drive solution. The D-Series is suitable for both sensor-less or servo-drive applications.

	Friction drive belts	Positive drive belts: Plastic modular belts	Positive drive belts: Thermoplastic homogeneous belts	Non-belt applications
				
Driven				
Without frequency inverter	Standard Drum Motor	Motors for applications with positive drive belts or no belts	Motors for applications with positive drive belts or no belts	Motors for applications with positive drive belts or no belts
With frequency inverter	Standard Asynchronous Drum Motor	Standard Asynchronous Drum Motor	Standard Asynchronous Drum Motor	Standard Asynchronous Drum Motor
Sensor-less or Servo Driver	Standard Synchronous Drum Motor	Standard Synchronous Drum Motor	Standard Synchronous Drum Motor	Standard Synchronous Drum Motor

APPLICATIONS FOR INTERROLL DRUM MOTORS

- ✓ **Friction drive belts** — Applications with friction drive belts use the friction between the Drum Motor shell and belt to drive the belt. Flat belts are one type of friction drive belt. In these applications the motor is cooled by the belt. These belts must be tensioned.
- ✓ **Plastic modular belts** — Applications with plastic modular belts are driven positively and need no tension: the profiled lagging or sprockets of the Drum Motor shell fit perfectly into the profile of the plastic modular belt. In order to prevent overheating of the Drum Motor, use either a Drum Motor for applications with positive drive belts or no belts or a Standard Asynchronous Drum Motor with frequency inverter.
- ✓ **Positive drive solid homogeneous belts** — The profile of the lower side of the belt fits into the profiled lagging of the Drum Motor shell. Little or no belt tension is applied. In order to prevent overheating of the Drum Motor, use either a Drum Motor for applications with positive drive belts or no belts or a Standard Asynchronous Drum Motor with frequency inverter.
- ✓ **Non-belt applications** — Some applications do not use belts. In order to prevent overheating of the Drum Motor, use either a Drum Motor for applications with positive drive belts or no belts or a Standard Asynchronous Drum Motor with frequency inverter.
- ✓ **All Applications** — Synchronous drum motors have excellent low running thermal characteristics – they generate significantly less heat loss and are therefore suitable for all the above applications. The fully controlled D-Series excels in high dynamic torque and stop/start applications and, using the appropriate driver, provides precise positioning, high acceleration/deceleration and wide variable speed range.

➲ **Standard Asynchronous Drum Motor without frequency inverter** p 12
- For friction drive belt applications

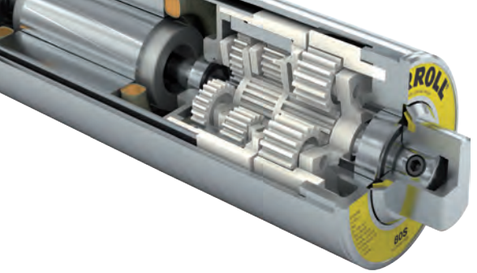
➲ **Standard Asynchronous Drum Motor with frequency inverter** p 12
- For friction drive belt applications
- For plastic modular belt applications
- For positive drive solid homogeneous belts
- For non-belt applications

➲ **Standard Synchronous Drum Motor** p 92
- For all belt types or no belt using either a sensor-less frequency inverter or servo-driver

OVERVIEW OF STANDARD ASYNCHRONOUS DRUM MOTORS

	80S	80i	113S	113i	138i	165i	217i
Diameter	81.5 mm	81.5 mm	113.3 mm	113.5 mm	138.0 mm	164.0 mm	217.5 mm
Gear material	Technopolymer	Steel	Technopolymer	Steel	Steel	Steel	Steel
Rated power	0.025 to 0.110 kW	0.033 to 0.120 kW	0.040 to 0.330 kW	0.058 to 0.370 kW	0.074 to 1.000 kW	0.306 to 2.200 kW	0.306 to 3.000 kW
Rated torque	3.4 to 21.4 Nm	2.3 to 26.8 Nm	5.5 to 43.8 Nm	7.4 to 86.4 Nm	14.7 to 174.4 Nm	28.1 to 365.2 Nm	28.1 to 533.6 Nm
Belt pull*	84 to 525 N	58 to 657 N	96 to 772 N	132 to 1,522 N	216 to 2,527 N	347 to 4,453 N	261 to 4,907 N
Velocity of the shell*	0.049 to 0.913 m/s	0.100 to 0.980 m/s	0.068 to 1.107 m/s	0.048 to 1.515 m/s	0.041 to 2.005 m/s	0.084 to 2.527 m/s	0.126 to 3.344 m/s
Shell length SL	260 to 952 mm	193 to 1,093 mm	240 to 1,090 mm	250 to 1,400 mm	300 to 1,600 mm	400 to 1,750 mm	400 to 1,750 mm
Friction drive belt	✓	✓	✓	✓	✓	✓	✓
Positive drive belt	×	✓	×	✓	✓	✓	✓
Without belt	×	✓	×	✓	✓	✓	✓
	p 14	p 24	p 34	p 44	p 56	p 68	p 80

Note: *Values of Belt pull and velocity are given for the shown diameter.



INTERROLL DRUM MOTOR 80S

Compact drive for small light-duty conveyors

Product Description

Applications

Because of its strength, reliability and zero maintenance, this drum motor is perfect for small infeed conveyors, packaging equipment and transfer conveyors.

- ✓ Small light-duty conveyors
- ✓ Cross belt feed conveyors
- ✓ Light-duty packaging equipment
- ✓ Dry and moist applications

Characteristics

- ✓ 3-phase or 1-phase AC induction motor
- ✓ Single-rated voltage
- ✓ Integral thermal motor protection
- ✓ Technopolymer planetary gearbox
- ✓ Low noise
- ✓ Lightweight
- ✓ Maintenance-free (with aluminium shaft caps)
- ✓ Lifetime lubricated
- ✓ Reversible

Technical Data

Electrical data	
Motor type	Asynchronous squirrel cage motor, IEC 34 (VDE 0530)
Insulation class of motor windings	Class F, IEC 34 (VDE 0530)
Voltage	230/400 V ±5 % (IEC 34/38)
Frequency	50 Hz
Internal shaft sealing system	Double-lipped, NBR
External shaft sealing system	Deflection seal, NBR
Protection rate	IP66 (with grease nipple)
Thermal protection (see p 227)	Bi-metal switch
Operating modes (see p 214)	S1
Ambient temperature, 3-phase motor (see p 191)	+5 to +40 °C
Ambient temperature, 1-phase motor (see p 191)	+5 to +40 °C
General technical data	
Max. shell length SL	952 mm

Order Information

Please refer to the Configurator at the end of the catalogue..

Material Versions

You can choose the following versions of drum body components and electrical connection. The versions depend on the material of the components.

Component	Version	Material			
		Aluminium	Mild steel	Stainless steel	Brass / Nickel
Shell	Crowned		✓	✓	
	Cylindrical		✓	✓	
End housing	Standard	✓		✓	
Shaft cap	Standard	✓			
	With cable protection	✓			
	Regreasable			✓	
Electrical connector	Straight connector			✓	✓
	Elbow connector			✓	
	Terminal box	✓		✓	

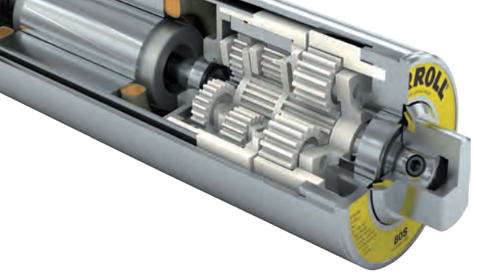
Please contact your Interroll customer consultant for further versions.

Options

- Lagging for friction drive belts, see p 116
- Food-grade oil (EU, FDA), see p 238
- Low temperature oil, see p 238
- cULus safety certifications, see p 233
- Non-horizontal mounting (more than ± 5°), see p 215

Accessories

- Mounting brackets, see p 148
- Idler pulleys, see p 162 to p 165
- Conveyor rollers, see p 172



Product Range

The following tables give an overview of the possible motor versions. When ordering, please specify the version in accordance with the configurator at the end of the catalogue.

All data and values in this catalogue refer to 50 Hz operation.

Motor versions

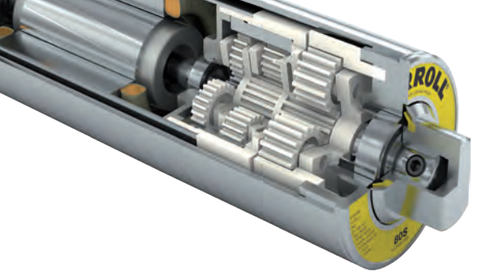
Mechanical data for 3-phase motors

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.040	4	3	78.55	0.072	16.8	19.5	479	295
			71.56	0.079	18.4	17.8	437	295
			63.51	0.089	20.8	15.8	387	295
0.050	2	3	115.20	0.102	23.9	16.8	412	270
0.060	4	2	19.20	0.293	68.8	7.5	183	295
			16.00	0.352	82.5	6.2	152	295
			13.09	0.430	100.8	5.1	125	295
0.075	2	3	96.00	0.125	29.4	20.6	505	270
0.085	2	3	78.55	0.152	35.6	19.5	479	270
			71.56	0.167	39.1	17.8	437	270
			63.51	0.188	44.1	15.8	387	270
			52.92	0.226	52.9	13.2	323	270
			48.79	0.245	57.4	12.1	298	270
			43.30	0.276	64.7	10.8	264	270
		2	19.20	0.622	145.8	5.0	123	270
			16.00	0.747	175.0	4.2	103	270
			13.09	0.913	213.9	3.4	84	270

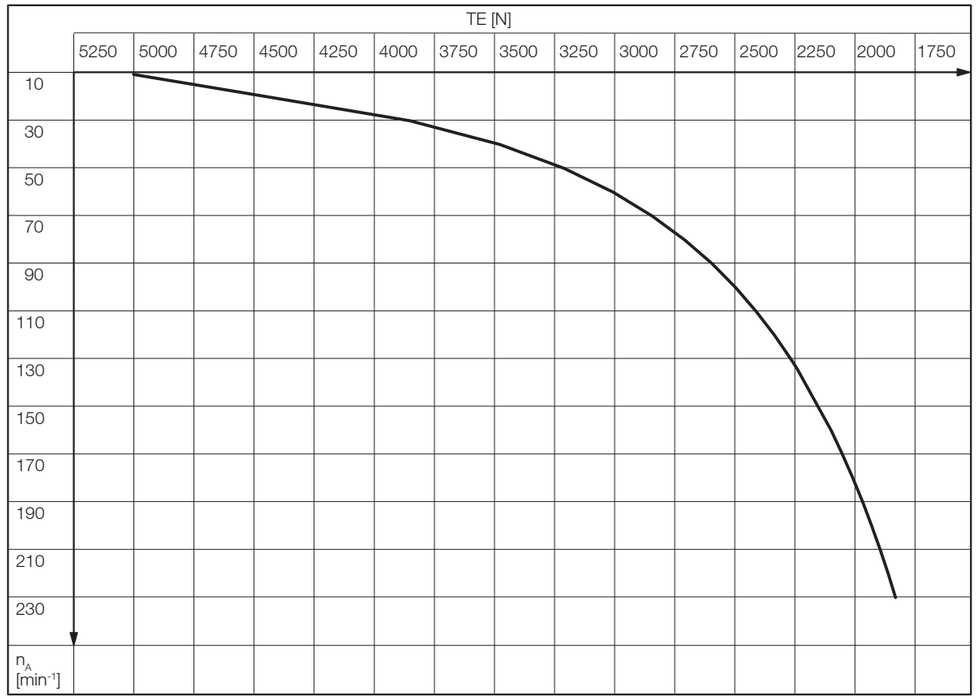
Mechanical data for 1-phase motors

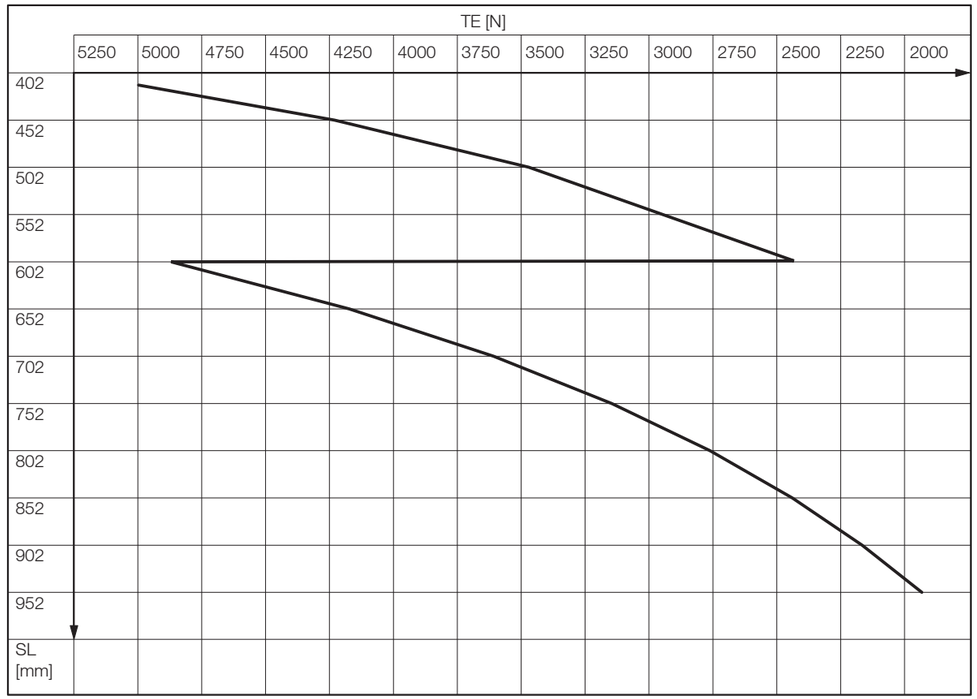
P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.025	4	3	115.20	0.049	11.5	17.8	436	285
			96.00	0.059	13.8	14.8	364	285
			78.55	0.072	16.8	12.1	297	285
			71.56	0.079	18.4	11.0	271	285
0.075	2	3	96.00	0.122	28.6	21.4	525	270
			78.55	0.149	35.0	17.5	430	270
			71.56	0.164	38.4	16.0	391	270
			63.51	0.185	43.3	14.2	347	270
0.085	2	3	78.55	0.149	35.0	20.2	496	285
			71.56	0.164	38.4	18.4	452	285
			63.51	0.185	43.3	16.3	401	285
0.110	2	3	63.51	0.185	43.3	20.7	508	285
			52.92	0.222	52.0	17.2	423	285
			48.79	0.241	56.4	15.9	390	285
			43.30	0.271	63.5	14.1	346	285
		2	19.20	0.611	143.2	6.6	162	285
			16.00	0.733	171.9	5.5	135	285
			13.09	0.896	210.1	4.5	110	285

P_N	Rated power
np	Number of poles
gs	Gear stages
i	Gear ratio
v	Rated velocity of the shell
n_A	Rated revolutions of the drum shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
SL_{min}	Min. shell length



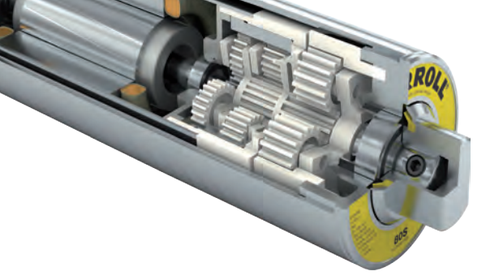
Belt Tension





Note: To get the right value of the maximum allowed belt tension, first find the maximum allowed TE value for the drum motor RPM. For motors with SL > 402 mm,check if the maximum allowed TE value for the SL is lower. In this case, use the lower value as maximum allowed TE value.

TE	Belt Tension
n_A	Rated revolutions of the drum shell
SL	Shell length



INTERROLL DRUM MOTOR 80S

Compact drive for small light-duty conveyors

Electrical data for 3-phase motors

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.040	4	230	0.71	0.65	0.21	1.0	1.8	1.60	1.60	1.60	156.5	36	-
		400	0.43	0.65	0.21	1.0	1.8	1.60	1.60	1.60	156.5	-	66
0.050	2	400	0.22	0.71	0.45	1.0	4.4	2.35	2.35	2.35	171.0	-	40
0.060	4	230	0.79	0.65	0.29	1.0	1.8	1.60	1.60	1.60	156.5	40	-
		400	0.46	0.65	0.29	1.0	1.8	1.60	1.60	1.60	156.5	-	70
0.075	2	230	0.51	0.69	0.53	1.0	4.6	2.50	2.50	2.50	111.3	20	-
		400	0.30	0.70	0.51	1.0	4.5	2.50	2.50	2.50	113.0	-	36
0.085	2	230	0.53	0.73	0.55	1.0	4.6	2.24	2.24	2.24	111.3	22	-
		400	0.32	0.74	0.52	1.0	4.5	2.24	2.24	2.24	113.0	-	40

Electrical data for 1-phase motors

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	U_{SH} ~ V DC	C_r µF
0.025	4	230	0.39	1.00	0.28	1.2	2.2	1.11	1.11	1.37	150.0	44	3
0.075	2	230	0.68	1.00	0.48	1.0	3.2	0.74	0.74	1.37	66.0	34	4
0.085	2	230	0.73	0.98	0.53	1.3	5.2	0.93	0.93	1.60	52.0	28	6
0.110	2	230	0.94	1.00	0.51	1.2	2.0	0.73	0.73	1.15	51.0	36	8

P_N	Rated power
np	Number of poles
U_N	Rated voltage
I_N	Rated current
cos φ	Power factor
η	Efficiency
J_R	Rotor moment of inertia
I_S/I_N	Ratio of starting current to rated current
M_S/M_N	Ratio of starting torque to rated torque
M_P/M_N	Ratio of pull-up torque to rated torque
M_B/M_N	Ratio of break-down torque to rated torque
R_M	Phase resistance
$U_{SH\ delta}$	Preheating voltage in delta connection
$U_{SH\ star}$	Preheating voltage in star connection
U_{SH}	Preheating voltage in single phase
C_r	Capacitor size

Cable Specifications

Available cables for connectors (see also p 236):

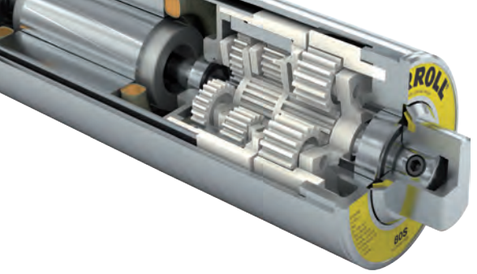
- Standard, screened
- Standard, unscreened
- Halogen-free, screened
- Halogen-free, unscreened

Available length: 1 / 3 / 5 m

Note: Only single voltage available with Halogen-free, screened cables.

Connection Diagrams

For connection diagrams, see Planning Section on p 240.



Standard dimensions

Dimensions

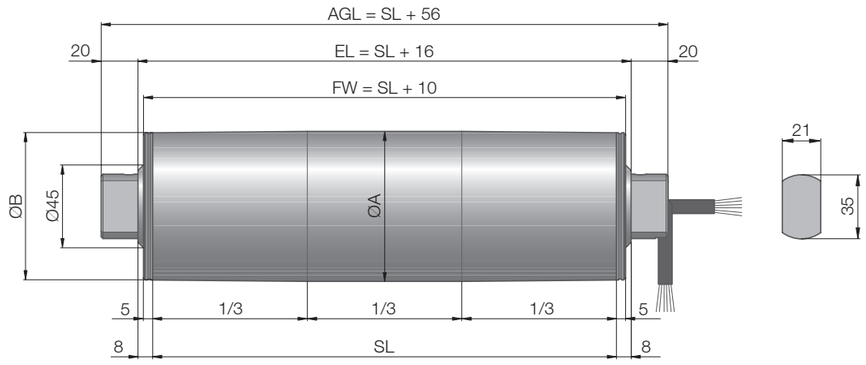


Fig.: Drum motor with shaft cap

Type	Ø A mm	Ø B mm
80S crowned shell length SL 260 to 602 mm	81.5	80.0
80S crowned mild steel shell length SL 603 to 952 mm	82.7	81.0
80S crowned stainless steel shell length SL 603 to 952 mm	83.0	80.0
80S cylindrical shell length SL 260 to 602 mm	80.5	80.5
80S cylindrical stainless steel shell length SL 603 to 952 mm	83.0	83.0
80S cylindrical mild steel shell* length SL 603 to 952 mm	82.7	82.7

Note: *The mild steel shell has a thin zinc layer additional to the 82.7 mm outer diameter.

Connector dimensions

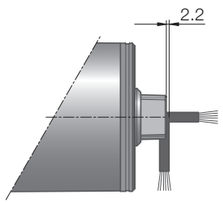


Fig.: Shaft cap, standard, aluminium

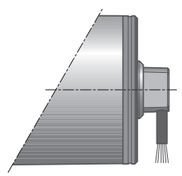


Fig.: Shaft cap with cable protection, aluminium

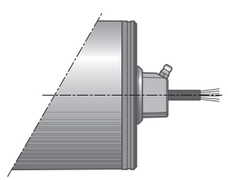


Fig.: Straight connector with regreasable shaft cap, stainless steel

Standard length and weight

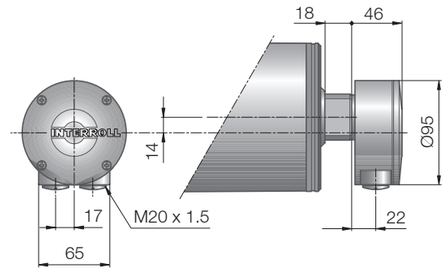


Fig.: Terminal box, aluminium

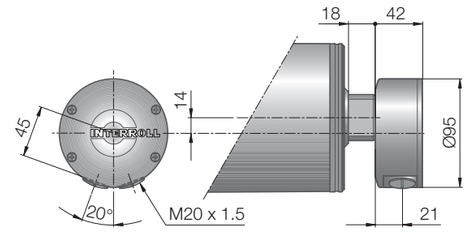
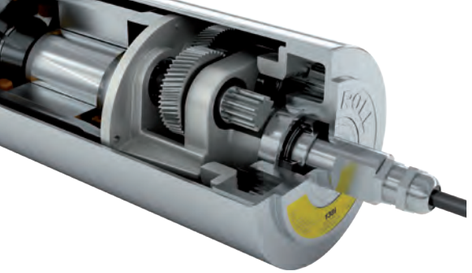


Fig.: Terminal box, stainless steel

Standard drum motor lengths and their weights:

Shell length SL in mm	270	285	302	352	402	452	502	552	602	652	702	752
Average weight in kg	4.7	5.2	5.3	5.7	6.1	6.5	6.9	7.3	7.7	10	10.5	11

Shell length SL in mm	802	852	902	952
Average weight in kg	11.5	12	12.5	13



INTERROLL DRUM MOTOR 80i

Compact and robust drive for small feed conveyors with high-duty cycles

Product Description

Applications

The drum motor is perfect for high torque applications with limited space or access.

- ✓ Small feed conveyors with high-duty cycles
- ✓ Packaging equipment
- ✓ Dynamic weighing equipment
- ✓ Metal detectors
- ✓ Pharmaceutical handling
- ✓ Food processing
- ✓ Steel or plastic modular belt applications
- ✓ Dry, wet and wash-down applications

Characteristics

- ✓ Salt-water-resistant aluminium end housings
- ✓ 3-phase AC induction motor
- ✓ Dual voltage
- ✓ Integral thermal motor protection
- ✓ Steel-hardened helical spur gear
- ✓ Low noise
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible
- ✓ Reinforced shaft for SL above 543 mm

Technical Data

Electrical data		
	Motor type	Asynchronous squirrel cage motor, IEC 34 (VDE 0530)
	Insulation class of motor windings	Class F, IEC 34 (VDE 0530)
	Voltage	230/400 V ±5 % (IEC 34/38) Most international voltages and frequencies can be supplied on request
	Frequency	50 Hz
	Internal shaft sealing system	Double-lipped, FPM
	Protection rate	IP66
	Thermal protection (see p 227)	Bi-metal switch
	Operating modes (see p 214)	S1
	Ambient temperature, 3-phase motor (see p 191)	+5 to +40 °C
	Ambient temperature, 3-phase motor for applications with positive drive belts, or without belts (see p 191)	+5 to +25 °C
General technical data		
	Max. shell length SL	1,093 mm

Order Information

Please refer to the Configurator at the end of the catalogue..

Material Versions

You can choose the following versions of drum body components and electrical connection. The versions depend on the material of the components.

Component	Version	Material				
		Aluminium	Mild steel	Stainless steel	Brass / Nickel	Techno-polymer
Shell	Crowned		✓	✓		
	Cylindrical		✓	✓		
	Cylindrical + key, for using sprockets		✓	✓		
End housing	Standard	✓		✓		
	With grooves and chain sprockets	✓		✓		
Shaft	Standard			✓		
	Cross-drilled and threaded, M6			✓		
External seal	Galvanised labyrinth		✓			
	Stainless steel Labyrinth			✓		
Electrical connector	Straight connector			✓	✓	
	Elbow connector			✓		✓

Please contact your Interroll customer consultant for further versions.

Options

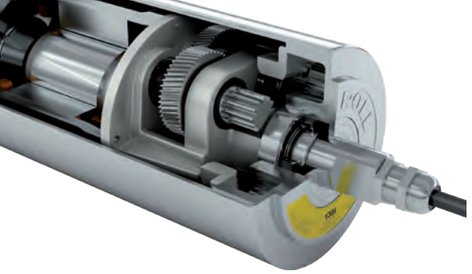
- Lagging for friction drive belts, see p 116
- Lagging for plastic modular belts, see p 122
- Lagging for positive drive solid homogeneous belts, see p 126
- Sprockets for plastic modular belts, see p 128
- Backstops, see p 134
- Balancing, see p 135
- Electromagnetic brakes and rectifiers, see p 136
- Feedback Devices, see p 142
- Food-grade oil (EU, FDA), see p 238
- Low temperature oil, see p 238
- Labyrinth with FPM, see p 230
- cULus safety certifications, see p 233
- Non-horizontal mounting (more than ± 5°), see p 215

Note: Combination of encoder and electromagnetic brake is not possible.

With an encoder, a special Ø 25 x 20 mm shaft is required. This shaft is only possible with a flat face end housing.

Accessories

- Mounting brackets, see p 152
- Idler pulleys, see p 162 to p 165
- Conveyor rollers, see p 172



INTERROLL DRUM MOTOR 80i

Compact and robust drive for small feed conveyors with high-duty cycles

Product Range

The following tables give an overview of the possible motor versions. When ordering, please specify the version in accordance with the configurator at the end of the catalogue.

All data and values in this catalogue refer to 50 Hz operation.

Motor versions

Mechanical data for 3-phase motors (Standard motors)

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.040	4	3	54.73	0.108	25.3	14.4	354	193*
			38.18	0.155	36.2	10.1	247	193*
			31.09	0.190	44.5	8.2	201	193*
		2	21.28	0.277	65.0	5.7	140	193*
			14.85	0.398	93.2	4.0	98	193*
			12.09	0.488	114.5	3.3	80	193*
0.070	4	3	54.73	0.100	23.5	26.8	657	243
			38.18	0.144	33.7	18.7	459	243
			31.09	0.177	41.4	15.2	373	243
		2	21.28	0.258	60.5	10.6	261	243
			14.85	0.370	86.7	7.4	182	243
			12.09	0.455	106.5	6.0	148	243
	2	3	54.73	0.217	50.8	12.4	303	193*
			38.18	0.310	72.8	8.6	212	193*
			31.09	0.381	89.4	7.0	172	193*
		2	21.28	0.557	130.5	4.9	120	193*
			14.85	0.798	187.1	3.4	84	193*
			12.09	0.980	229.8	2.8	68	193*
0.120	2	3	54.73	0.217	50.8	21.1	518	243
			38.18	0.310	72.8	14.7	362	243
			31.09	0.381	89.4	12.0	294	243
		2	21.28	0.557	130.5	8.4	206	243
			14.85	0.798	187.1	5.8	143	243
			12.09	0.980	229.8	4.8	117	243

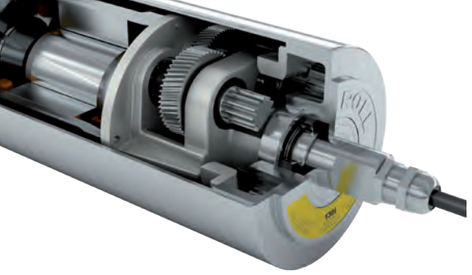
Note: *The maximum SL for this motors is 273 mm and only single voltage is available.

Mechanical data for 3-phase motors (Motors for applications with positive drive belts or no belts)

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.033	4	3	54.73	0.107	25.3	11.8	293	193*
			38.18	0.154	36.2	8.3	204	193*
			31.09	0.189	44.5	6.7	166	193*
		2	21.28	0.276	65.0	4.7	116	193*
			14.85	0.395	93.2	3.3	81	193*
			12.09	0.485	114.5	2.7	66	193*
0.058	4	3	54.73	0.102	23.9	21.8	538	243
			38.18	0.146	34.3	15.2	375	243
			31.09	0.179	42.1	12.4	306	243
		2	21.28	0.261	61.6	8.6	213	243
			14.85	0.374	88.2	6.0	149	243
			12.09	0.460	108.3	4.9	121	243
	2	3	54.73	0.213	50.2	10.4	256	193*
			38.18	0.305	72.0	7.2	178	193*
			31.09	0.375	88.5	5.9	145	193*
		2	21.28	0.548	129.2	4.1	101	193*
			14.85	0.785	185.2	2.9	71	193*
			12.09	0.964	227.4	2.3	58	193*
0.099	2	3	54.73	0.211	49.8	17.9	441	243
			38.18	0.303	71.4	12.5	308	243
			31.09	0.372	87.7	10.2	251	243
		2	21.28	0.543	128.1	7.1	175	243
			14.85	0.779	183.7	4.9	122	243
			12.09	0.957	225.5	4.0	99	243

Note: *The maximum SL for this motors is 273 mm and only single voltage is available.

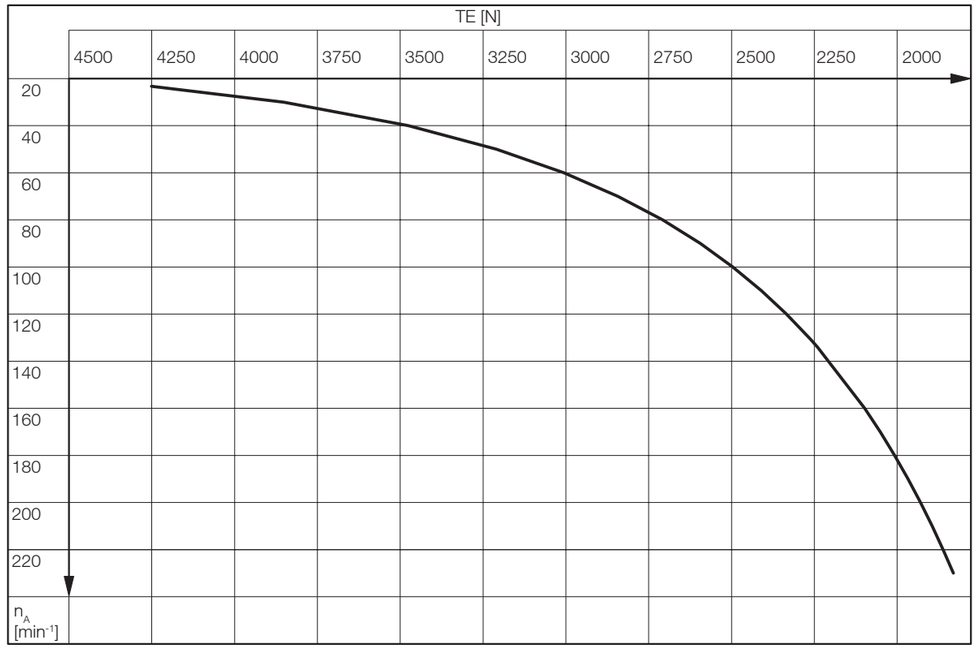
P_N	Rated power
np	Number of poles
gs	Gear stages
i	Gear ratio
v	Rated velocity of the shell
n_A	Rated revolutions of the drum shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
SL_{min}	Min. shell length

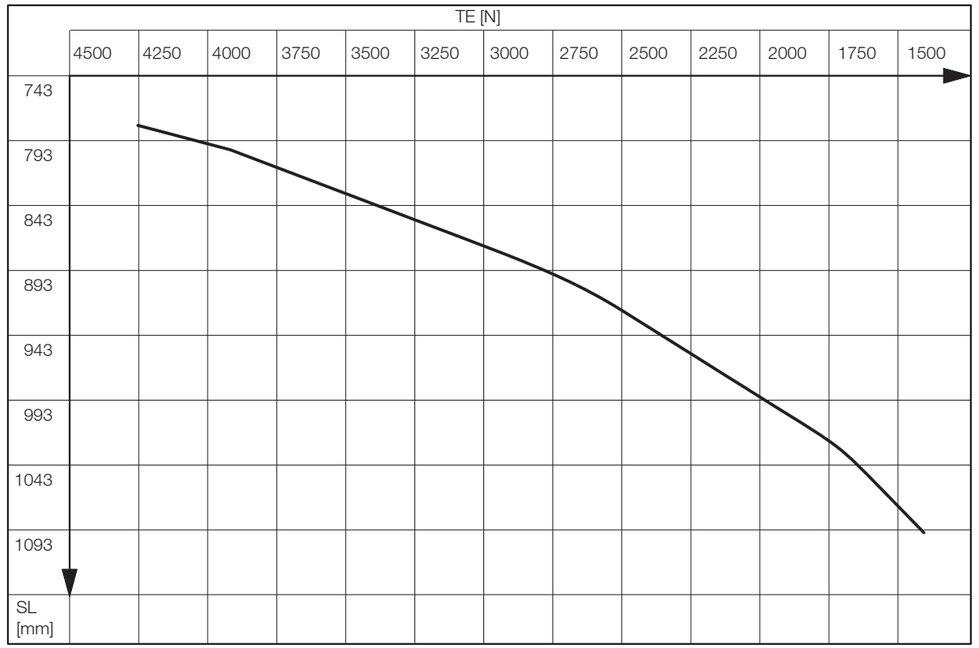


INTERROLL DRUM MOTOR 80i

Compact and robust drive for small feed conveyors with high-duty cycles

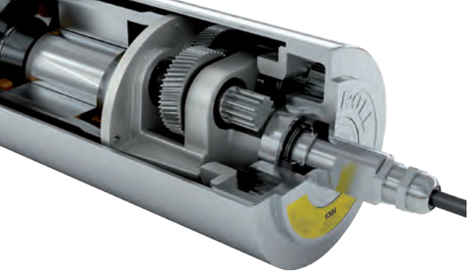
Belt Tension





Note: To get the right value of the maximum allowed belt tension, first find the maximum allowed TE value for the drum motor RPM. For motors with SL > 750 mm,check if the maximum allowed TE value for the SL is lower. In this case, use the lower value as maximum allowed TE value.

TE	Belt Tension
n_A	Rated revolutions of the drum shell
SL	Shell length



INTERROLL DRUM MOTOR 80i

Compact and robust drive for small feed conveyors with high-duty cycles

Electrical data for 3-phase motors (Standard motors)

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.040	4	230	0.37	0.68	0.41	0.4	1.9	1.80	1.80	2.00	240.0	30	-
		400	0.21	0.68	0.41	0.4	1.9	1.80	1.80	2.00	240.0	-	51
0.070	4	230	0.48	0.68	0.53	0.6	1.4	1.66	1.66	1.75	156.0	25	-
		400	0.28	0.68	0.53	0.6	1.4	1.66	1.66	1.75	156.0	-	45
	2	230	0.38	0.82	0.56	0.4	2.6	1.90	1.90	2.00	190.0	30	-
		400	0.22	0.82	0.56	0.4	2.6	1.90	1.90	2.00	190.0	-	51
0.120	2	230	0.59	0.78	0.65	0.6	2.6	2.00	2.00	2.10	89.0	20	-
		400	0.34	0.78	0.65	0.6	2.6	2.00	2.00	2.10	89.0	-	35

Electrical data for 3-phase motors (Motors for applications with positive drive belts or no belts)

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.033	4	230	0.30	0.62	0.45	0.4	1.7	2.73	2.48	2.74	286.5	27	-
		400	0.17	0.62	0.45	0.4	1.7	2.73	2.48	2.74	286.5	-	45
0.058	4	230	0.39	0.68	0.54	0.6	2.4	2.31	2.15	2.31	106.4	14	-
		400	0.23	0.68	0.54	0.6	2.4	2.31	2.15	2.31	106.4	-	25
	2	230	0.26	0.78	0.71	0.4	2.4	2.15	1.90	2.26	183.5	19	-
		400	0.15	0.78	0.71	0.4	2.4	2.15	1.90	2.26	183.5	-	32
0.099	2	230	0.45	0.78	0.71	0.6	2.4	2.31	2.15	2.31	106.4	19	-
		400	0.26	0.78	0.71	0.6	2.4	2.31	2.15	2.31	106.4	-	32

P_N	Rated power
np	Number of poles
U_N	Rated voltage
I_N	Rated current
cos φ	Power factor
η	Efficiency
J_R	Rotor moment of inertia
I_S/I_N	Ratio of starting current to rated current
M_S/M_N	Ratio of starting torque to rated torque
M_P/M_N	Ratio of pull-up torque to rated torque
M_B/M_N	Ratio of break-down torque to rated torque
R_M	Phase resistance
$U_{SH\ delta}$	Preheating voltage in delta connection
$U_{SH\ star}$	Preheating voltage in star connection

Cable Specifications

Available cables for connectors (see also p 234):

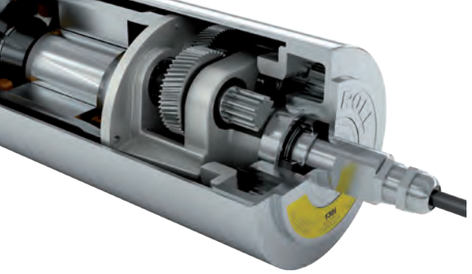
- Standard, screened
- Standard, unscreened
- Halogen-free, screened
- Halogen-free, unscreened

Halogen-free cables are not available for motors with UL certification.

Available length: 1 / 3 / 5 / 10 m

Connection Diagrams

For connection diagrams, see Planning Section on p 242.



INTERROLL DRUM MOTOR 80i

Compact and robust drive for small feed conveyors with high-duty cycles

Standard dimensions

Dimensions

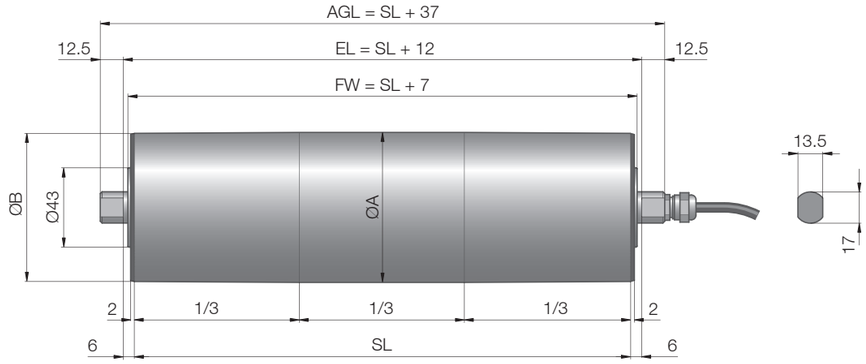


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
80i crowned shell	81.5	80.5
80i cylindrical shell	81.0	81.0
80i cylindrical shell + key	81.7	81.7

Connector dimensions

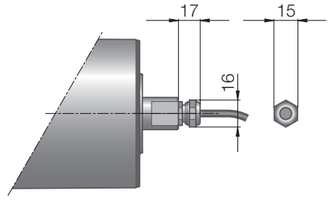


Fig.: Straight connector, brass/nickel

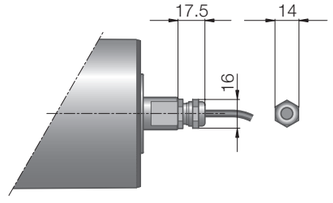


Fig.: Straight connector, stainless steel

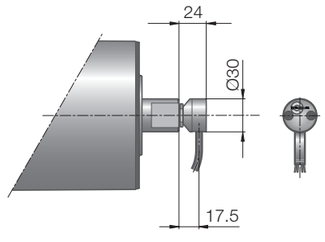


Fig.: Elbow connector, stainless steel

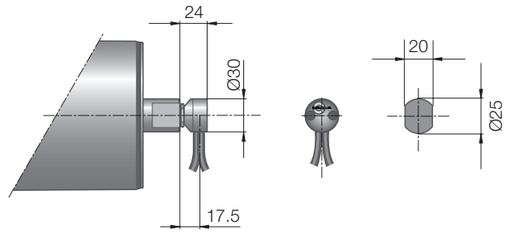


Fig.: Elbow connector / Feedback device, stainless steel

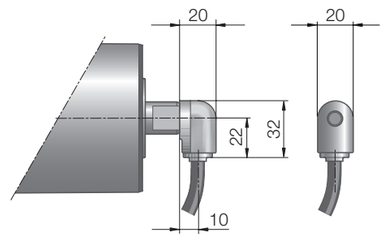


Fig.: Elbow connector, technopolymer

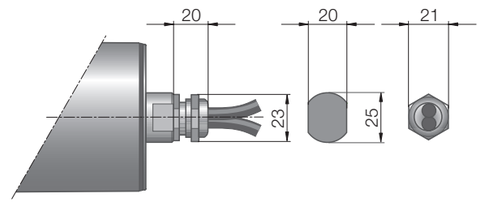


Fig.: Straight connector / Feedback device, brass/nickel

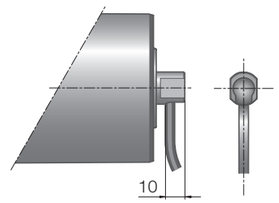


Fig.: Cable slot connector

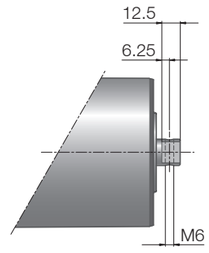


Fig.: Shaft, cross-drilled and threaded

Shafts for fixing

Min. length with option for 80i

The following options increase the minimum length of the drum motor.

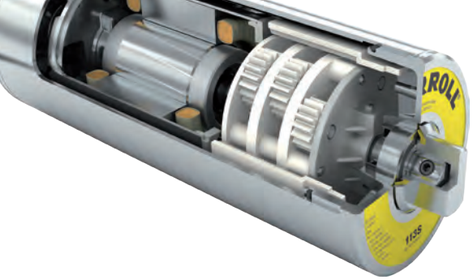
Option	Min. SL with option mm
Brake	Min. 193 + 70; Min. 243 + 50
Encoder	Min. 193 + 70; Min. 243 + 50
Backstop	Min. 193 + 50; Min. 243 + 30
Cable slot connector	Min. SL + 50

Standard length and weight

Standard drum motor lengths and their weights:

Shell length SL in mm	193	243	293	343	393	443	493	543	593	643
Average weight in kg	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	9.35	8.80

Shell length SL in mm	693	743	793	843	893	943	993	1,043	1,093
Average weight in kg	9.35	9.90	10.45	11.00	11.55	12.10	12.65	13.20	13.75



INTERROLL DRUM MOTOR 113S

Compact drive for light-duty conveyors

Product Description

Applications

The drum motor is a perfect drive station for small and medium-duty conveyor systems.

- ✓ Light-duty conveyors
- ✓ Packaging equipment
- ✓ Bottle recycling
- ✓ X-ray security scanning systems
- ✓ Pharmaceutical handling
- ✓ Dry and moist applications

Characteristics

- ✓ 3-phase or 1-phase AC induction motor
- ✓ Single-rated voltage
- ✓ Integral thermal motor protection
- ✓ Technopolymer planetary gearbox
- ✓ Low noise
- ✓ Lightweight
- ✓ Maintenance-free (with aluminium shaft caps)
- ✓ Lifetime lubricated
- ✓ Reversible

Technical Data

Electrical data	
Motor type	Asynchronous squirrel cage motor, IEC 34 (VDE 0530)
Insulation class of motor windings	Class F, IEC 34 (VDE 0530)
Voltage	230/400 V ±5 % (IEC 34/38)
Frequency	50 Hz
Internal shaft sealing system	Double-lipped, NBR
External shaft sealing system	Deflection seal, NBR
Protection rate	IP66 (with grease nipple)
Thermal protection (see p 227)	Bi-metal switch
Operating modes (see p 214)	S1
Ambient temperature, 3-phase motor (see p 191)	+5 to +40 °C
Ambient temperature, 1-phase motor (see p 191)	+5 to +40 °C
General technical data	
Max. shell length SL	1,090 mm

Order Information

Please refer to the Configurator at the end of the catalogue..

Material Versions

You can choose the following versions of drum body components and electrical connection. The versions depend on the material of the components.

Component	Version	Material			
		Aluminium	Mild steel	Stainless steel	Brass / Nickel
Shell	Crowned		✓	✓	
	Cylindrical		✓	✓	
End housing	Standard	✓		✓	
Shaft cap	Standard	✓			
	With cable protection	✓			
	Regreasable			✓	
Electrical connector	Straight connector			✓	✓
	Elbow connector			✓	
	Terminal box	✓		✓	

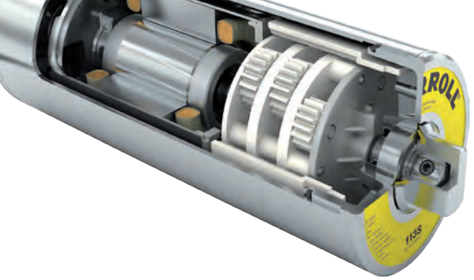
Please contact your Interroll customer consultant for further versions.

Options

- Lagging for friction drive belts, see p 116
- Food-grade oil (EU, FDA), see p 238
- Low temperature oil, see p 238
- cULus safety certifications, see p 233
- Non-horizontal mounting (more than ± 5°), see p 215

Accessories

- Mounting brackets, see p 148
- Idler pulleys, see p 162 to p 165
- Conveyor rollers, see p 172



INTERROLL DRUM MOTOR 113S

Compact drive for light-duty conveyors

Product Range

The following tables give an overview of the possible motor versions. When ordering, please specify the version in accordance with the configurator at the end of the catalogue.

All data and values in this catalogue refer to 50 Hz operation.

Motor versions

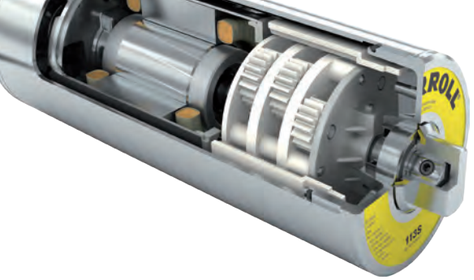
Mechanical data for 3-phase motors

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.040	8	3	63.00	0.068	11.4	28.6	505	260
			49.29	0.087	14.6	22.4	395	260
			38.51	0.111	18.7	17.5	309	260
0.110	4	3	63.00	0.129	21.7	41.6	734	240
			49.29	0.164	27.7	32.5	574	240
			44.09	0.184	31.0	29.1	514	240
			38.51	0.210	35.4	25.4	449	240
			30.77	0.263	44.4	20.3	359	240
			26.84	0.302	50.9	17.7	313	240
			23.96	0.338	57.0	15.8	279	240
		2	15.00	0.540	91.0	10.4	184	240
			11.57	0.700	118.0	8.0	142	240
			10.27	0.788	132.9	7.1	126	240
			8.88	0.912	153.8	6.2	109	240
			7.86	1.031	173.7	5.5	96	240
0.160	4	3	44.09	0.182	30.6	42.7	754	260
0.180	4	3	38.51	0.209	35.2	41.9	740	275
			30.77	0.261	44.0	33.5	591	275
			26.84	0.300	50.5	29.2	516	275
			23.96	0.335	56.6	26.1	461	275
		2	15.00	0.536	90.3	17.2	303	275
			11.57	0.695	117.1	13.3	234	275
			10.27	0.782	131.9	11.8	208	275
			8.88	0.905	152.6	10.2	180	275
			7.86	1.023	172.5	9.0	159	275
0.330	2	3	44.09	0.377	63.5	42.7	754	275
			38.51	0.431	72.7	37.3	659	275
			30.77	0.540	91.0	29.8	526	275
			26.84	0.619	104.3	26.0	459	275
			23.96	0.693	116.9	23.2	410	275
		2	15.00	1.107	186.7	15.3	270	275

Mechanical data for 1-phase motors

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.060	4	3	63.00	0.122	20.6	23.8	420	240
			49.29	0.156	26.4	18.6	328	240
			44.09	0.175	29.5	16.6	294	240
			38.51	0.200	33.8	14.5	256	240
			30.77	0.251	42.3	11.6	205	240
			26.84	0.287	48.4	10.1	179	240
			23.96	0.322	54.3	9.0	160	240
		2	15.00	0.514	86.7	6.0	105	240
0.080	6	2	15.00	0.352	59.3	11.6	206	275
			11.57	0.456	76.9	9.0	159	275
0.110	4	3	63.00	0.122	20.6	43.8	772	260
			49.29	0.156	26.4	34.2	604	260
			44.09	0.175	29.5	30.6	541	260
			38.51	0.200	33.8	26.7	472	260
			30.77	0.251	42.3	21.4	377	260
			26.84	0.287	48.4	18.6	329	260
			23.96	0.322	54.3	16.6	294	260
		2	15.00	0.514	86.7	11.0	194	260
			11.57	0.666	112.3	8.5	149	260

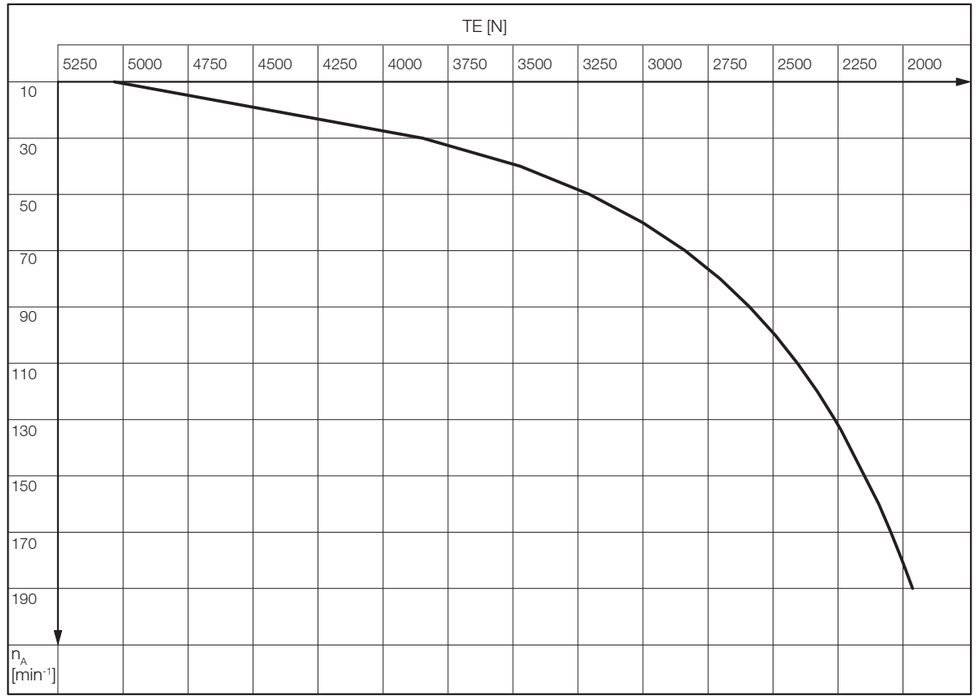
P_N	Rated power
np	Number of poles
gs	Gear stages
i	Gear ratio
v	Rated velocity of the shell
n_A	Rated revolutions of the drum shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
SL_{min}	Min. shell length

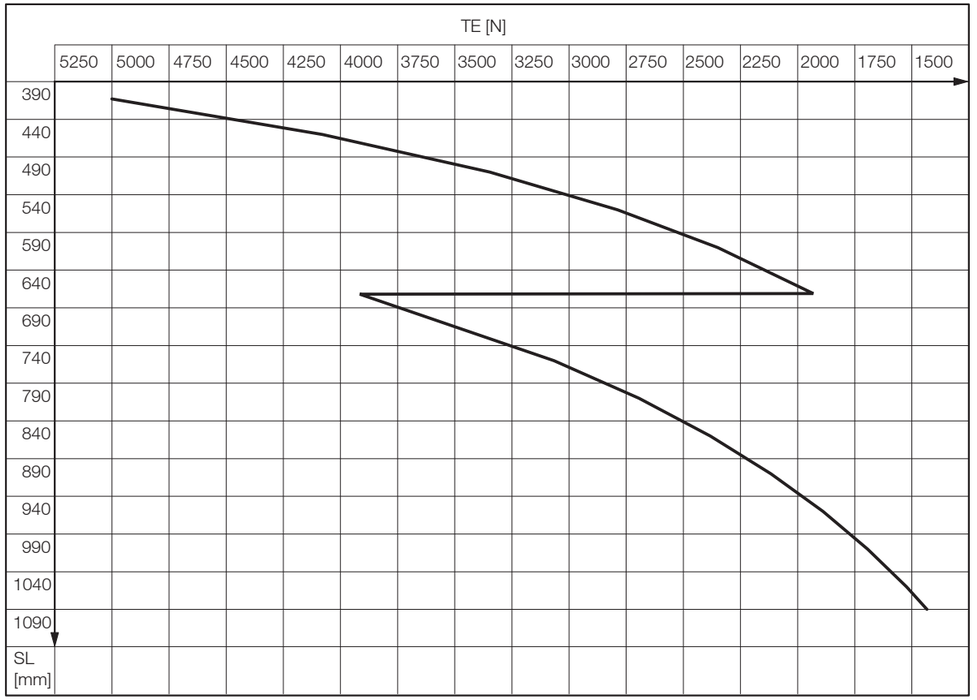


INTERROLL DRUM MOTOR 113S

Compact drive for light-duty conveyors

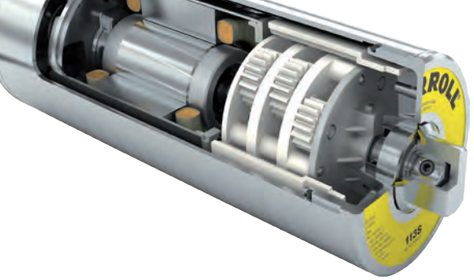
Belt Tension





Note: To get the right value of the maximum allowed belt tension, first find the maximum allowed TE value for the drum motor RPM. For motors with SL > 400 mm,check if the maximum allowed TE value for the SL is lower. In this case, use the lower value as maximum allowed TE value.

TE	Belt Tension
n_A	Rated revolutions of the drum shell
SL	Shell length



INTERROLL DRUM MOTOR 113S

Compact drive for light-duty conveyors

Electrical data for 3-phase motors

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.040	8	230	0.64	0.58	0.27	3.9	1.5	1.59	1.49	1.59	187.5	35	-
		400	0.37	0.58	0.27	3.9	1.5	1.59	1.49	1.59	187.5	-	60
0.110	4	230	0.80	0.73	0.47	2.3	3.6	3.38	3.38	3.39	84.0	25	-
		400	0.45	0.75	0.47	2.3	3.6	3.41	3.41	3.42	84.0	-	43
0.160	4	230	0.98	0.76	0.54	3.3	4.0	3.22	3.22	3.33	59.2	22	-
		400	0.57	0.75	0.54	3.3	4.0	3.25	3.25	3.35	59.2	-	38
0.180	4	230	1.00	0.77	0.59	4.0	4.4	3.54	3.54	3.74	45.5	18	-
		400	0.62	0.76	0.55	4.0	4.4	3.60	3.60	3.79	45.5	-	32
0.330	2	230	1.74	0.76	0.68	3.3	4.5	3.57	2.62	3.57	21.5	14	-
		400	0.93	0.76	0.68	3.3	4.5	3.57	2.62	3.57	21.5	-	23

Electrical data for 1-phase motors

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	U_{SH} ~ V DC	C_r µF
0.060	4	230	0.74	0.98	0.36	2.3	2.6	1.29	1.29	2.60	63.5	35	4
0.080	6	230	1.35	0.99	0.26	4.0	1.9	0.70	0.70	1.65	45.9	46	8
0.110	4	230	1.13	0.88	0.48	3.2	2.9	1.06	1.06	2.31	32.5	24	6

P_N	Rated power
np	Number of poles
U_N	Rated voltage
I_N	Rated current
cos φ	Power factor
η	Efficiency
J_R	Rotor moment of inertia
I_S/I_N	Ratio of starting current to rated current
M_S/M_N	Ratio of starting torque to rated torque
M_P/M_N	Ratio of pull-up torque to rated torque
M_B/M_N	Ratio of break-down torque to rated torque
R_M	Phase resistance
$U_{SH\ delta}$	Preheating voltage in delta connection
$U_{SH\ star}$	Preheating voltage in star connection
U_{SH}	Preheating voltage in single phase
C_r	Capacitor size

Cable Specifications

Available cables for connectors (see also p 236):

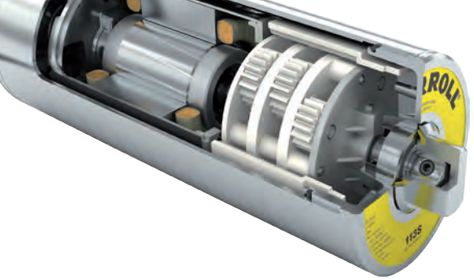
- Standard, screened
- Standard, unscreened
- Halogen-free, screened
- Halogen-free, unscreened

Available length: 1 / 3 / 5 m

Note: Only single voltage available with Halogen-free, screened cables.

Connection Diagrams

For connection diagrams, see Planning Section on p 240.



Standard dimensions

Dimensions

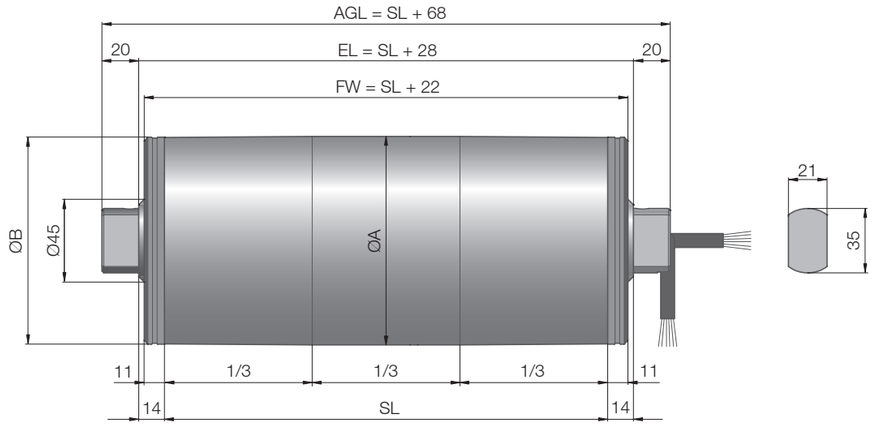


Fig.: Drum motor with shaft cap

Type	Ø A mm	Ø B mm
113S crowned shell	113.3	112.4
113S cylindrical shell	113.0	113.0

Connector dimensions

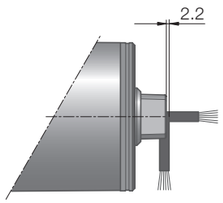


Fig.: Shaft cap, standard, aluminium

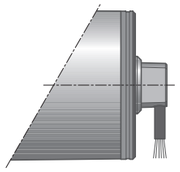


Fig.: Shaft cap with cable protection, aluminium

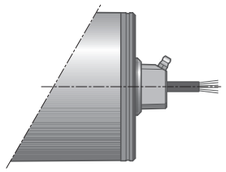


Fig.: Straight connector with regreasable shaft cap, stainless steel

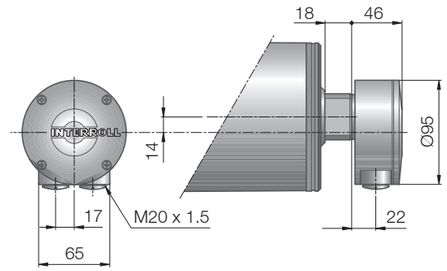


Fig.: Terminal box, aluminium

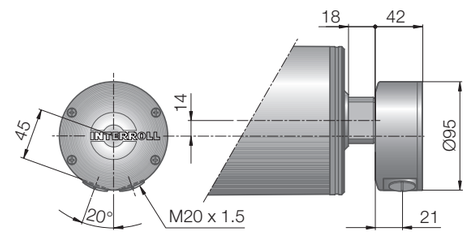


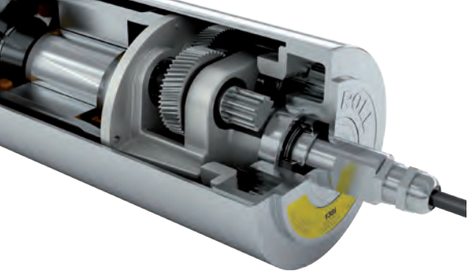
Fig.: Terminal box, stainless steel

Standard length and weight

Standard drum motor lengths and their weights:

Shell length SL in mm	240	290	340	390	440	490	540	590	640	690	740	790	840
Average weight in kg	7.6	8.3	9	9.7	10.4	11.1	11.8	12.5	13.2	13.9	14.6	15.3	16

Shell length SL in mm	890	940	990	1,040	1,090
Average weight in kg	16.7	17.4	18.1	18.8	19.5



INTERROLL DRUM MOTOR 113i

Power-packed drive for small conveyors with high-duty cycles

Product Description

Applications

This drum motor has been developed especially for applications requiring a strong drive.

- ✓ Small conveyors with high-duty cycles
- ✓ Airport check-in conveyors
- ✓ Packaging equipment
- ✓ Dynamic weighing equipment
- ✓ Metal detectors
- ✓ Pharmaceutical handling
- ✓ Food processing
- ✓ Steel or plastic modular belt applications
- ✓ Dry, wet and wash down-applications

Characteristics

- ✓ Salt-water-resistant aluminium end housings
- ✓ 3-phase AC induction motor
- ✓ Dual voltage
- ✓ Integral thermal motor protection
- ✓ Steel-hardened helical spur gear
- ✓ Low noise
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible
- ✓ Reinforced shaft for SL above 850 mm

Technical Data

Electrical data	
Motor type	Asynchronous squirrel cage motor, IEC 34 (VDE 0530)
Insulation class of motor windings	Class F, IEC 34 (VDE 0530)
Voltage	230/400 V ±5 % (IEC 34/38) Most international voltages and frequencies can be supplied on request
Frequency	50 Hz
Internal shaft sealing system	Double-lipped, FPM
Protection rate	IP66
Thermal protection (see p 227)	Bi-metal switch
Operating modes (see p 214)	S1
Ambient temperature, 3-phase motor (see p 191)	+5 to +40 °C
Ambient temperature, 3-phase motor for applications with positive drive belts, or without belts (see p 191)	+5 to +25 °C
General technical data	
Max. shell length SL	1,400 mm

Order Information

Please refer to the Configurator at the end of the catalogue..

Material Versions

You can choose the following versions of drum body components and electrical connection. The versions depend on the material of the components.

Component	Version	Material				
		Aluminium	Mild steel	Stainless steel	Brass / Nickel	Techno-polymer
Shell	Crowned		✓	✓		
	Cylindrical		✓	✓		
	Cylindrical + key, for using sprockets		✓	✓		
End housing	Standard	✓		✓		
	With grooves or chain sprockets	✓		✓		
Shaft	Standard		✓	✓		
	Cross-drilled thread, M8		✓	✓		
External seal	Galvanised labyrinth		✓			
	Stainless steel labyrinth			✓		
Electrical connector	Straight connector			✓	✓	
	Elbow connector			✓		✓
	Terminal box	✓		✓		✓

Please contact your Interroll customer consultant for further versions.

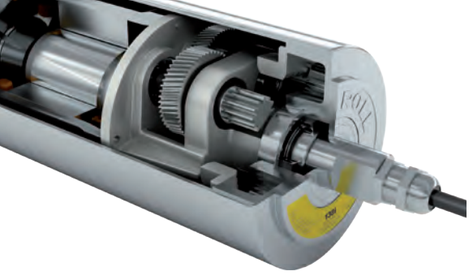
Options

- Lagging for friction drive belts, see p 116
- Lagging for plastic modular belts, see p 122
- Lagging for positive drive solid homogeneous belts, see p 126
- Sprockets for plastic modular belts, see p 128
- Backstops, see p 134
- Balancing, see p 135
- Electromagnetic brakes and rectifiers, see p 136
- Feedback Devices, see p 142
- Food-grade oil (EU, FDA), see p 238
- Low temperature oil, see p 238
- Labyrinth with FPM, see p 230
- cULus safety certifications, see p 233
- Non-horizontal mounting (more than ± 5°), see p 215

Note: Combination of encoder and electromagnetic brake is not possible.

Accessories

- Mounting brackets, see p 152
- Idler pulleys, see p 162 to p 165
- Conveyor rollers, see p 172



INTERROLL DRUM MOTOR 113i

Power-packed drive for small conveyors with high-duty cycles

Product Range

The following tables give an overview of the possible motor versions. When ordering, please specify the version in accordance with the configurator at the end of the catalogue.
All data and values in this catalogue refer to 50 Hz operation.

Motor versions

Mechanical data for 3-phase motors (Standard motors)

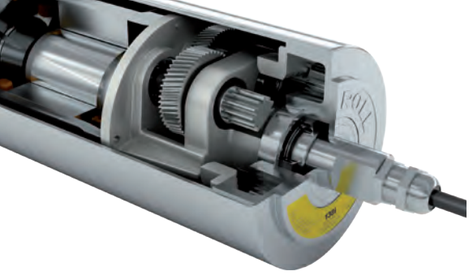
P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.070	12*	3	43.49	0.048	8.1	77.4	1,363	300
			37.05	0.057	9.5	65.9	1,161	300
			31.96	0.066	11.0	56.9	1,002	300
0.080	8	3	43.49	0.093	15.6	45.8	808	250
			37.05	0.109	18.4	39.1	688	250
0.100	6	3	43.49	0.118	19.9	45.0	793	250
			37.05	0.139	23.3	38.4	676	250
0.150	8	3	37.05	0.109	18.3	73.6	1,296	300
	4	3	43.49	0.184	31.0	43.4	764	250
			31.96	0.251	42.2	31.9	562	250
			28.17	0.285	47.9	28.1	495	250
			24.00	0.334	56.2	23.9	422	250
			20.71	0.387	65.2	20.7	364	250
		2	15.17	0.529	89.0	15.4	272	250
			12.92	0.621	104.5	13.2	232	250
			11.15	0.720	121.1	11.4	200	250
0.180	6	3	43.49	0.125	21.0	76.9	1,356	300
			37.05	0.147	24.7	65.6	1,155	300
		2	11.15	0.488	82.1	20.1	355	300
0.225	2	3	43.49	0.386	64.9	31.1	548	250
			31.96	0.525	88.3	22.9	403	250
			28.17	0.595	100.1	20.2	355	250
			24.00	0.699	117.5	17.2	303	250
			20.71	0.810	136.2	14.8	261	250
		2	15.17	1.105	186.0	11.1	195	250
			12.92	1.297	218.3	9.4	166	250
			11.15	1.504	253.0	8.1	143	250
0.300	4	3	43.49	0.188	31.6	85.1	1,500	300
			31.96	0.256	43.1	62.6	1,103	300
			28.17	0.290	48.8	55.2	972	300
			24.00	0.341	57.3	47.0	828	300
			20.71	0.395	66.5	40.5	714	300
		2	15.17	0.539	90.7	30.3	534	300
			12.92	0.633	106.5	25.8	455	300
			11.15	0.733	123.4	22.3	392	300
0.370	4	3	24.00	0.322	54.2	61.4	1,083	300
			20.71	0.373	62.8	53.0	934	300
		2	12.92	0.598	100.7	33.8	595	300
			11.15	0.693	116.7	29.1	513	300
	2	3	43.49	0.387	65.2	51.2	901	300
			31.96	0.527	88.7	37.6	663	300
			28.17	0.598	100.6	33.1	584	300
			24.00	0.702	118.1	28.2	498	300
			20.71	0.814	136.9	24.4	429	300
		2	15.17	1.111	186.9	18.2	321	300
			12.92	1.304	219.4	15.5	273	300
			11.15	1.511	254.3	13.4	236	300

Note: *Not suitable for all applications. Please contact your Interroll customer consultant.

Mechanical data for 3-phase motors (Motors for applications with positive drive belts or no belts)

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.058	12	3	43.49	0.048	8.1	64.2	1,147	300
			31.96	0.065	11.0	47.2	843	300
			28.17	0.073	12.5	41.6	743	300
0.066	8	3	43.49	0.092	15.6	37.9	678	250
			37.05	0.108	18.4	32.3	577	250
0.083	6	3	43.49	0.117	19.9	37.5	669	250
			37.05	0.137	23.3	31.9	570	250
0.124	8	3	37.05	0.107	18.3	60.9	1,088	300
	4	3	43.49	0.183	31.3	35.6	637	250
			31.96	0.250	42.5	26.2	468	250
			28.17	0.283	48.3	23.1	412	250
			24.00	0.332	56.7	19.7	351	250
			20.71	0.385	65.7	17.0	303	250
		2	15.17	0.526	89.7	12.7	227	250
			12.92	0.617	105.2	10.8	193	250
			11.15	0.715	122.0	9.3	167	250
0.149	6	3	43.49	0.123	21.0	63.6	1,136	300
			37.05	0.145	24.7	54.2	968	300
		2	11.15	0.481	82.1	16.7	297	300
0.207	2	3	43.49	0.384	65.5	28.2	504	250
			31.96	0.523	89.2	20.8	371	250
			28.17	0.593	101.2	18.3	327	250
			24.00	0.696	118.8	15.6	278	250
			20.71	0.807	137.6	13.4	240	250
		2	15.17	1.102	187.9	10.1	180	250
			12.92	1.293	220.5	8.6	153	250
			11.15	1.499	255.6	7.4	132	250
0.248	4	3	43.49	0.179	30.6	72.9	1,302	300
			31.96	0.244	41.6	53.6	957	300
			28.17	0.277	47.2	47.2	844	300
			24.00	0.325	55.4	40.3	719	300
			20.71	0.376	64.2	34.7	620	300
		2	15.17	0.514	87.6	26.0	464	300
			12.92	0.603	102.8	22.1	395	300
			11.15	0.699	119.2	19.1	341	300
0.306	4	3	24.00	0.336	57.3	48.0	857	300
			20.71	0.390	66.5	41.4	739	300
		2	15.17	0.532	90.7	30.9	553	300
			12.92	0.624	106.5	26.4	471	300
			11.15	0.724	123.4	22.7	406	300
	2	3	43.49	0.388	66.2	41.5	742	300
			31.96	0.528	90.1	30.5	545	300
			28.17	0.600	102.2	26.9	481	300
			24.00	0.704	120.0	22.9	409	300
			20.71	0.816	139.1	19.8	353	300
		2	15.17	1.113	189.9	14.8	264	300
			12.92	1.307	222.9	12.6	225	300
			11.15	1.515	258.3	10.9	194	300

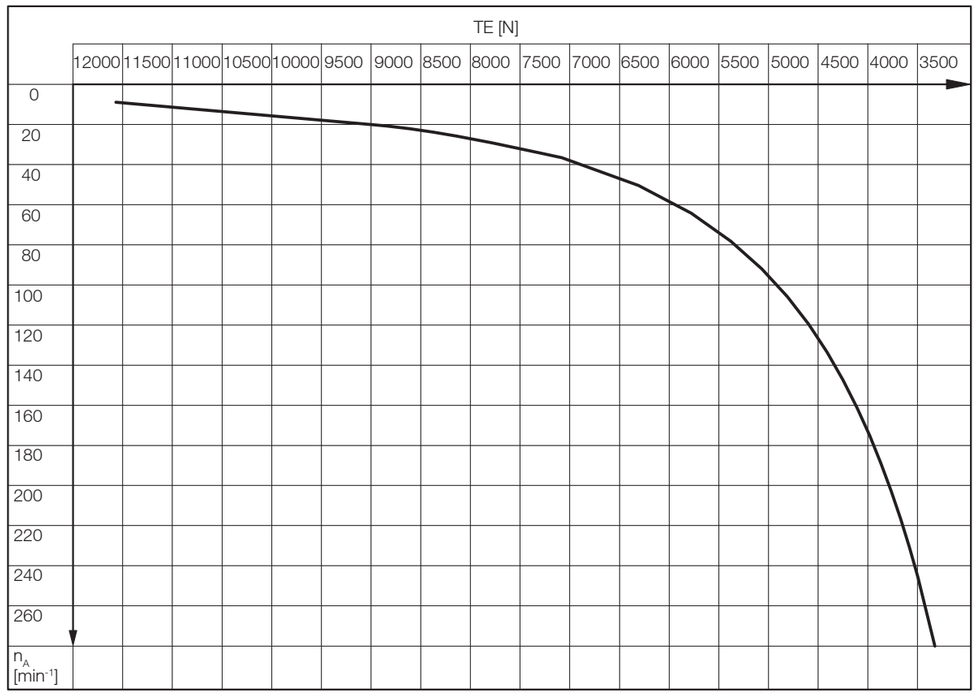
P_N	Rated power	n_A	Rated revolutions of the drum shell
np	Number of poles	M_A	Rated torque of drum motor
gs	Gear stages	F_N	Rated belt pull of drum motor
i	Gear ratio	SL_{min}	Min. shell length
v	Rated velocity of the shell		

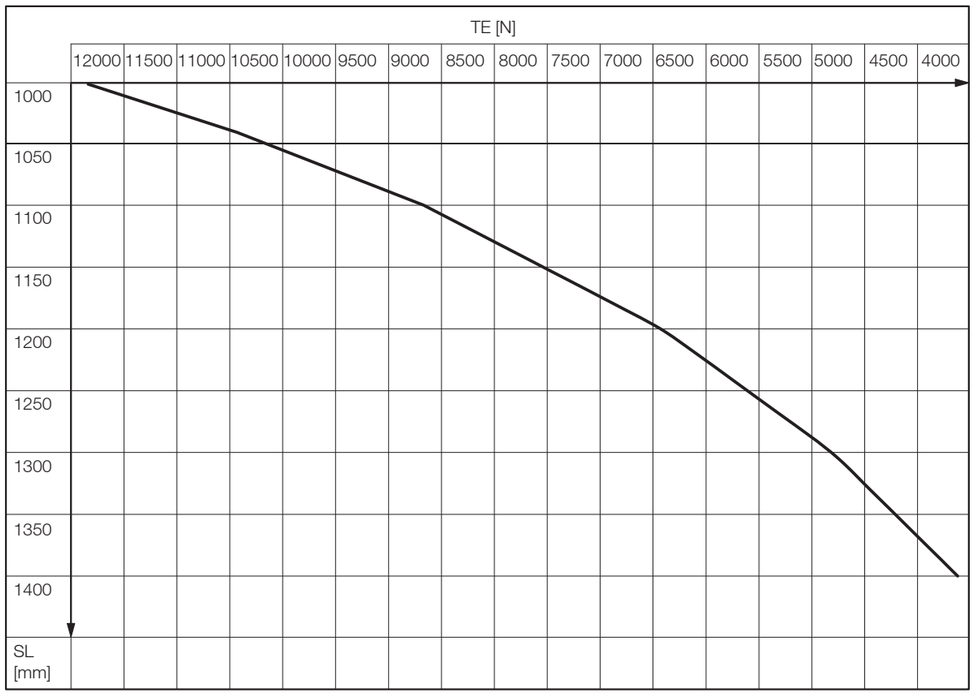


INTERROLL DRUM MOTOR 113i

Power-packed drive for small conveyors with high-duty cycles

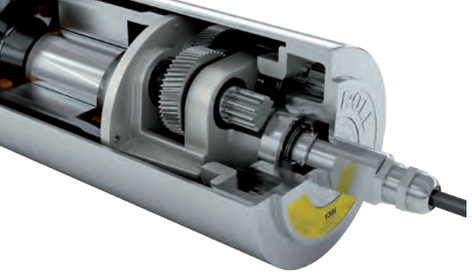
Belt Tension





Note: To get the right value of the maximum allowed belt tension, first find the maximum allowed TE value for the drum motor RPM. For motors with SL > 1,000 mm,check if the maximum allowed TE value for the SL is lower. In this case, use the lower value as maximum allowed TE value.

TE	Belt Tension
n_A	Rated revolutions of the drum shell
SL	Shell length



INTERROLL DRUM MOTOR 113i

Power-packed drive for small conveyors with high-duty cycles

Electrical data for 3-phase motors (Standard motors)

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.070	12	230	1.07	0.60	0.27	5.7	2.0	1.00	1.00	1.30	128.0	41	-
		400	0.62	0.60	0.27	5.7	2.0	1.00	1.00	1.30	128.0	-	71
0.080	8	230	0.69	0.60	0.48	3.3	2.2	1.40	1.40	1.60	164.0	34	-
		400	0.40	0.60	0.48	3.3	2.2	1.40	1.40	1.60	164.0	-	59
0.100	6	230	0.80	0.66	0.47	3.3	2.1	1.80	1.80	2.00	111.4	29	-
		400	0.46	0.66	0.47	3.3	2.1	1.80	1.80	2.00	111.4	-	51
0.150	8	230	1.18	0.62	0.51	5.7	2.2	1.35	1.35	1.50	89.0	33	-
		400	0.68	0.62	0.51	5.7	2.2	1.35	1.35	1.50	89.0	-	56
	4	230	0.94	0.71	0.56	2.1	3.2	1.85	1.85	2.15	71.0	24	-
		400	0.54	0.71	0.56	2.1	3.2	1.85	1.85	2.15	71.0	-	41
0.180	6	230	1.39	0.62	0.52	5.7	2.4	2.80	2.80	3.00	42.8	18	-
		400	0.80	0.62	0.52	5.7	2.4	2.80	2.80	3.00	42.8	-	32
0.225	2	230	1.21	0.71	0.65	1.4	4.6	3.50	3.50	3.70	29.6	13	-
		400	0.70	0.71	0.65	1.4	4.6	3.50	3.50	3.70	29.6	-	22
0.300	4	230	1.58	0.79	0.60	3.8	3.2	1.70	1.70	1.90	41.0	26	-
		400	0.91	0.79	0.60	3.8	3.2	1.70	1.70	1.90	41.0	-	44
0.370	4	230	1.91	0.79	0.62	3.8	3.2	2.40	2.20	2.30	26.4	20	-
		400	1.10	0.79	0.62	3.8	3.2	2.40	2.20	2.30	26.4	-	34
	2	230	1.91	0.79	0.62	2.4	6.1	3.65	3.65	3.90	16.5	12	-
		400	1.10	0.79	0.62	2.4	6.1	3.65	3.65	3.90	16.5	-	22

Electrical data for 3-phase motors (Motors for applications with positive drive belts or no belts)

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.058	12	230	0.91	0.60	0.26	5.7	1.9	1.07	0.91	1.16	144.0	39	-
		400	0.53	0.60	0.26	5.7	1.9	1.07	0.91	1.16	144.0	-	69
0.066	8	230	0.55	0.60	0.50	3.3	2.0	1.57	1.74	1.82	190.0	31	-
		400	0.32	0.60	0.50	3.3	2.0	1.57	1.74	1.82	190.0	-	55
0.083	6	230	0.66	0.63	0.50	3.3	1.9	1.82	1.49	1.74	126.4	26	-
		400	0.38	0.63	0.50	3.3	1.9	1.82	1.49	1.74	126.4	-	45
0.124	8	230	0.97	0.62	0.52	5.7	2.0	2.32	2.05	2.18	97.0	29	-
		400	0.56	0.62	0.52	5.7	2.0	2.32	2.05	2.18	97.0	-	51
	4	230	0.65	0.70	0.67	2.1	2.9	1.57	1.32	1.57	86.0	20	-
		400	0.38	0.70	0.67	2.1	2.9	1.57	1.32	1.57	86.0	-	34
0.149	6	230	1.02	0.62	0.59	5.7	2.2	2.81	2.48	2.64	54.8	17	-
		400	0.59	0.62	0.59	5.7	2.2	2.81	2.48	2.64	54.8	-	30
0.207	2	230	1.10	0.71	0.66	1.4	4.2	2.48	2.31	2.56	36.1	14	-
		400	0.64	0.71	0.66	1.4	4.2	2.48	2.31	2.56	36.1	-	25
0.248	4	230	1.02	0.79	0.77	3.8	2.9	2.23	2.07	2.23	49.8	20	-
		400	0.59	0.79	0.77	3.8	2.9	2.23	2.07	2.23	49.8	-	35
0.306	4	230	1.43	0.78	0.68	3.8	2.9	2.23	2.07	2.23	41.5	23	-
		400	0.83	0.78	0.68	3.8	2.9	2.23	2.07	2.23	41.5	-	40
	2	230	1.41	0.79	0.68	2.4	4.2	2.48	2.31	2.56	20.5	11	-
		400	0.82	0.79	0.68	2.4	4.2	2.48	2.31	2.56	20.5	-	20

P_N	Rated power
np	Number of poles
U_N	Rated voltage
I_N	Rated current
cos φ	Power factor
η	Efficiency
J_R	Rotor moment of inertia
I_S/I_N	Ratio of starting current to rated current
M_S/M_N	Ratio of starting torque to rated torque
M_P/M_N	Ratio of pull-up torque to rated torque
M_B/M_N	Ratio of break-down torque to rated torque
R_M	Phase resistance
$U_{SH\ delta}$	Preheating voltage in delta connection
$U_{SH\ star}$	Preheating voltage in star connection

Cable Specifications

Available cables for connectors (see also p 234):

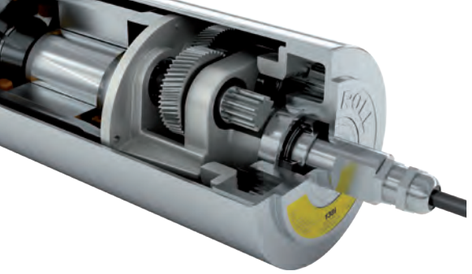
- Standard, screened
- Standard, unscreened
- Halogen-free, screened
- Halogen-free, unscreened

Halogen-free cables are not available for motors with UL certification.

Available length: 1 / 3 / 5 / 10 m

Connection Diagrams

For connection diagrams, see Planning Section on p 242.



Standard dimensions

Dimensions

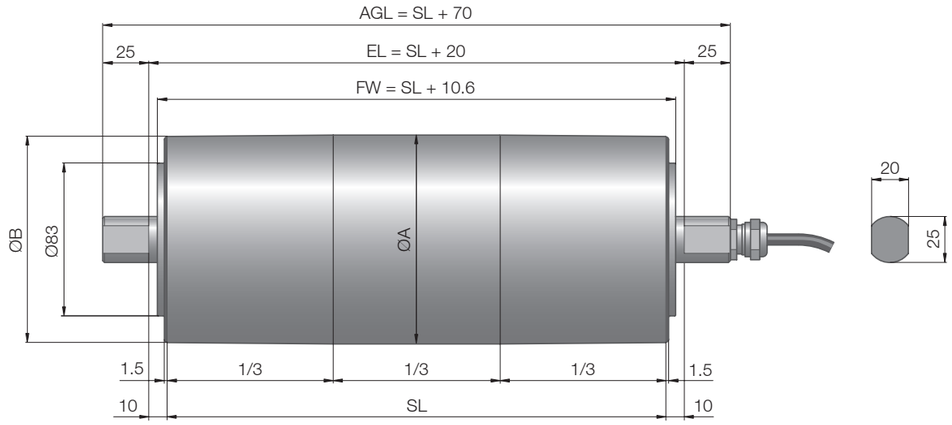


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
113i crowned shell	113.5	112.0
113i cylindrical shell	112.0	112.0
113i cylindrical shell + key	113.0	113.0

Connector dimensions

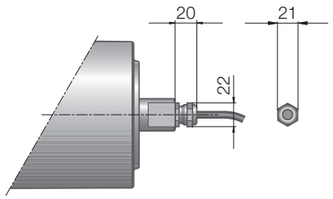


Fig.: Straight connector, brass/nickel

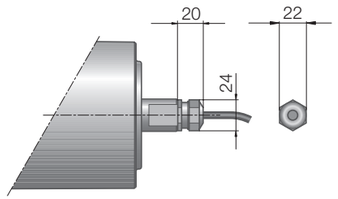


Fig.: Straight connector, stainless steel

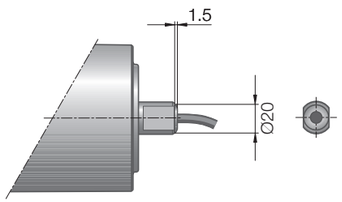


Fig.: Straight cable outlet, PU shaft plug

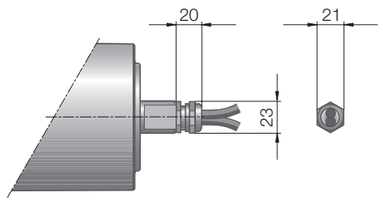


Fig.: Straight connector / Feedback device, brass/nickel

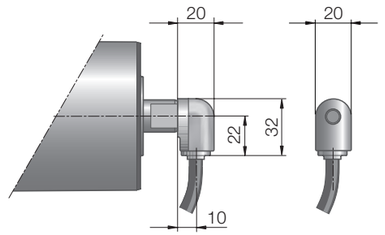


Fig.: Elbow connector, technopolymer

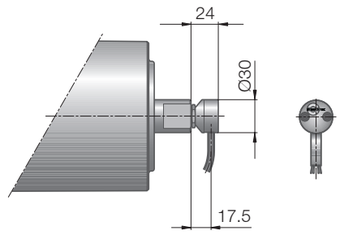


Fig.: Elbow connector, stainless steel

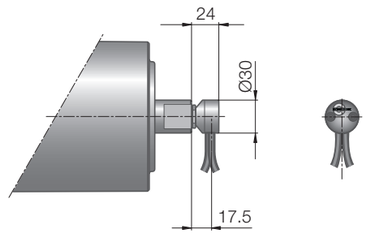


Fig.: Elbow connector / Feedback device, stainless steel

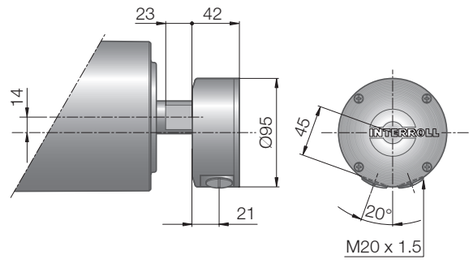


Fig.: Terminal box, stainless steel

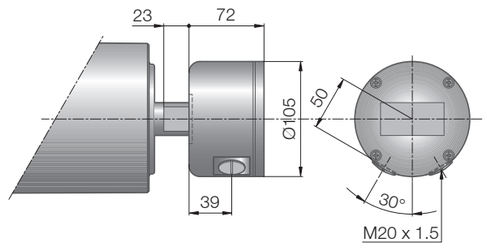


Fig.: Terminal box, technopolymer

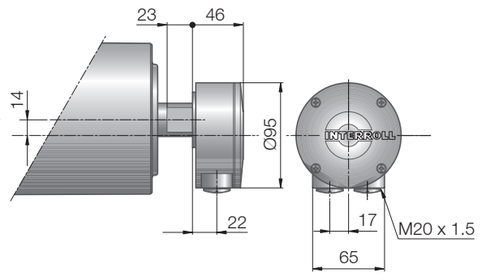
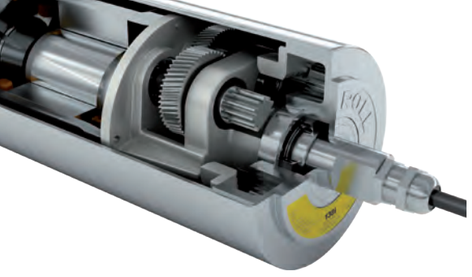


Fig.: Terminal box, aluminium



INTERROLL DRUM MOTOR 113i

Power-packed drive for small conveyors with high-duty cycles

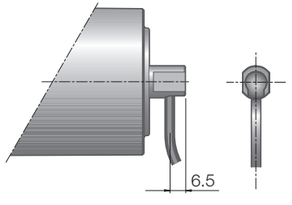


Fig.: Cable slot connector

Shafts for fixing

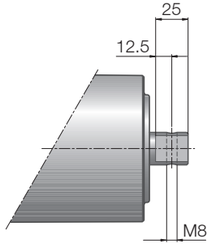


Fig.: Shaft, cross-drilled and threaded

Min. length with option

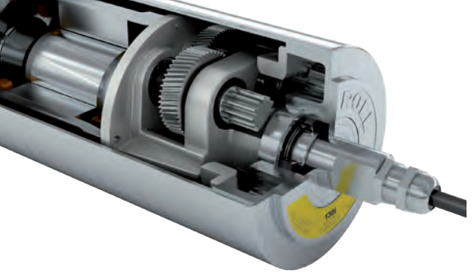
The following options increase the minimum length of the drum motor.

Option	Min. SL with option mm
Brake	Min. SL + 50
Encoder	Min. SL + 50
Cable slot connector	Min. SL + 50

Standard length and weight

Standard drum motor lengths and their weights:

Shell length SL in mm	250	300	350	400	450	500	550	600	650	700	750	800	850
Average weight in kg	8.50	9.15	9.80	10.45	11.10	11.75	12.40	13.05	13.70	14.35	15.0	15.65	17.93
Shell length SL in mm	900	950	1,000	1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400		
Average weight in kg	18.65	19.36	20.08	20.79	21.51	22.22	22.94	23.65	24.37	25.08	25.80		



INTERROLL DRUM MOTOR 138i

Strong powerful drive for conveyors with high-duty cycles

Product Description

Applications

The drum motor is a real all-round component because of its wide power and speed range.

- ✓ Conveyors with high-duty cycles
- ✓ Transport conveyors
- ✓ Logistics applications
- ✓ Airport check-in conveyors
- ✓ Mobile conveyors
- ✓ Food processing
- ✓ Steel or plastic modular belt applications
- ✓ Dry, wet and wash-down applications

Characteristics

- ✓ Salt-water-resistant aluminium end housings
- ✓ 3-phase AC induction motor
- ✓ Dual voltage
- ✓ Integral thermal motor protection
- ✓ Steel-hardened helical spur gear
- ✓ Low noise
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible
- ✓ Reinforced shaft for SL above 900 mm

Technical Data

Electrical data	
Motor type	Asynchronous squirrel cage motor, IEC 34 (VDE 0530)
Insulation class of motor windings	Class F, IEC 34 (VDE 0530)
Voltage	230/400 V ±5 % (IEC 34/38) Most international voltages and frequencies can be supplied on request
Frequency	50 Hz
Internal shaft sealing system	Double-lipped, FPM
Protection rate	IP66
Thermal protection (see p 227)	Bi-metal switch
Operating modes (see p 214)	S1
Ambient temperature, 3-phase motor (see p 191)	+5 to +40 °C
Ambient temperature, 3-phase motor for applications with positive drive belts, or without belts (see p 191)	+5 to +25 °C
General technical data	
Max. shell length SL	1,600 mm

Order Information

Please refer to the Configurator at the end of the catalogue..

Material Versions

You can choose the following versions of drum body components and electrical connection. The versions depend on the material of the components.

Component	Version	Material				
		Aluminium	Mild steel	Stainless steel	Brass / Nickel	Techno-polymer
Shell	Crowned		✓	✓		
	Cylindrical		✓	✓		
	Cylindrical + key, for using sprockets		✓	✓		
End housing	Standard	✓		✓		
	With grooves or chain sprockets	✓		✓		
Shaft	Standard		✓	✓		
	Cross-drilled thread, M8		✓	✓		
External seal	Galvanised labyrinth		✓			
	Stainless steel labyrinth			✓		
Electrical connector	Straight connector			✓	✓	
	Elbow connector			✓		✓
	Terminal box	✓		✓		✓

Please contact your Interroll customer consultant for further versions.

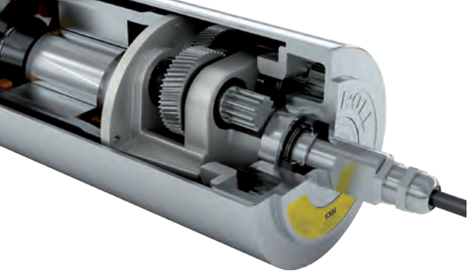
Options

- Lagging for friction drive belts, see p 116
- Lagging for plastic modular belts, see p 122
- Lagging for positive drive solid homogeneous belts, see p 126
- Sprockets for plastic modular belts, see p 128
- Backstops, see p 134
- Balancing, see p 135
- Electromagnetic brakes and rectifiers, see p 136
- Feedback Devices, see p 142
- Food-grade oil (EU, FDA), see p 238
- Low temperature oil, see p 238
- Labyrinth with FPM, see p 230
- cULus safety certifications, see p 233
- Non-horizontal mounting (more than ± 5°), see p 215

Note: Combination of encoder and electromagnetic brake is not possible.

Accessories

- Mounting brackets, see p 152
- Idler pulleys, see p 162 to p 165
- Conveyor rollers, see p 172



INTERROLL DRUM MOTOR 138i

Strong powerful drive for conveyors with high-duty cycles

Product Range

The following tables give an overview of the possible motor versions. When ordering, please specify the version in accordance with the configurator at the end of the catalogue.

All data and values in this catalogue refer to 50 Hz operation.

Motor versions

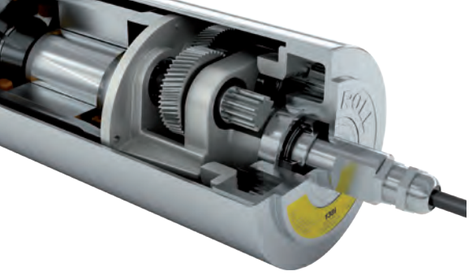
Mechanical data for 3-phase motors

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.090	12	3	72.55	0.041	5.7	136.7	1,981	300
0.180	8	3	72.55	0.068	9.4	165.8	2,403	300
			40.91	0.121	16.7	96.0	1,391	300
0.250	6	3	72.55	0.091	12.5	173.1	2,508	300
0.370	4	3	72.55	0.133	18.5	174.4	2,527	300
			61.85	0.157	21.7	150.1	2,175	300
			49.64	0.195	27.0	121.4	1,760	300
			40.91	0.237	32.8	100.9	1,463	300
			34.00	0.285	39.4	83.9	1,216	300
			30.55	0.317	43.9	75.4	1,092	300
			25.39	0.381	52.8	62.8	910	300
		2	20.22	0.479	66.3	50.5	732	300
			16.67	0.581	80.4	42.0	608	300
			12.44	0.778	107.7	31.4	455	300
			10.00	0.968	134.0	25.3	366	300
0.550	2	3	72.55	0.281	39.0	122.9	1,780	300
			61.85	0.330	45.7	105.7	1,532	300
			49.64	0.411	56.9	85.6	1,240	300
			40.91	0.499	69.1	71.1	1,031	300
			34.00	0.601	83.1	59.1	856	300
			25.39	0.804	111.3	44.3	641	300
		2	20.22	1.010	139.7	35.6	516	300
			16.67	1.225	169.6	29.6	428	300
			12.44	1.641	227.1	22.1	321	300
			10.00	2.042	282.6	17.8	258	300
0.750	4	3	34.00	0.293	40.6	164.9	2,390	350
			30.55	0.327	45.2	148.1	2,147	350
			25.39	0.393	54.4	123.5	1,790	350
		2	20.22	0.493	68.3	99.3	1,438	350
			16.67	0.599	82.9	82.5	1,195	350
			12.44	0.802	111.0	61.8	895	350
			10.00	0.998	138.1	49.6	719	350
1.000	2	3	49.64	0.404	55.9	158.2	2,293	350
			40.91	0.490	67.8	131.5	1,906	350
			34.00	0.590	81.6	109.3	1,584	350
			25.39	0.790	109.3	81.9	1,186	350
		2	20.22	0.992	137.2	65.8	953	350
			16.67	1.203	166.5	54.7	792	350
			12.44	1.611	223.0	40.9	593	350
			10.00	2.005	277.5	32.9	477	350

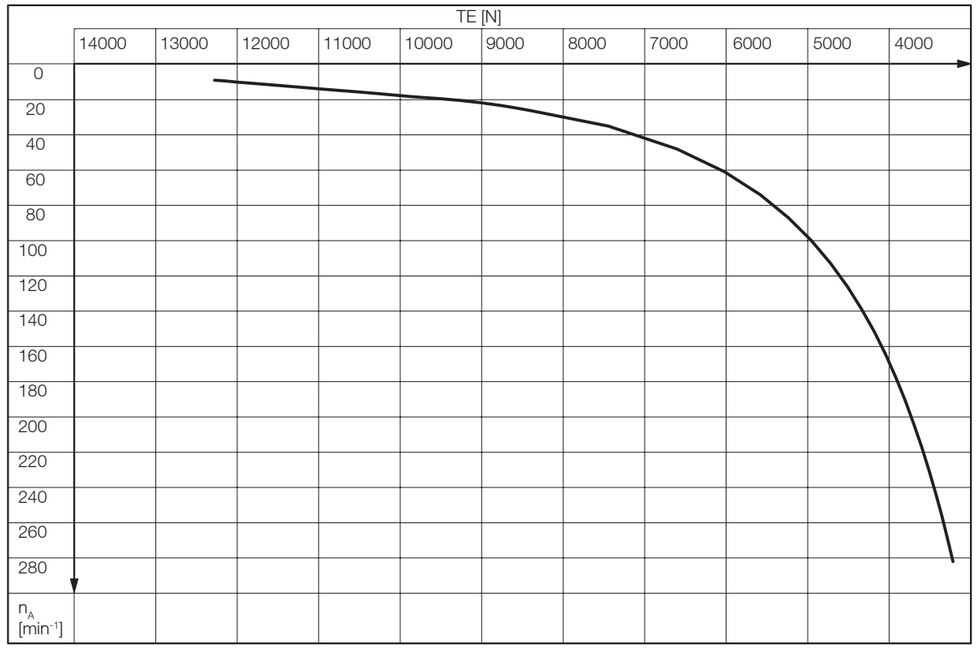
Mechanical data for 3-phase motors (Motors for applications with positive drive belts or no belts)

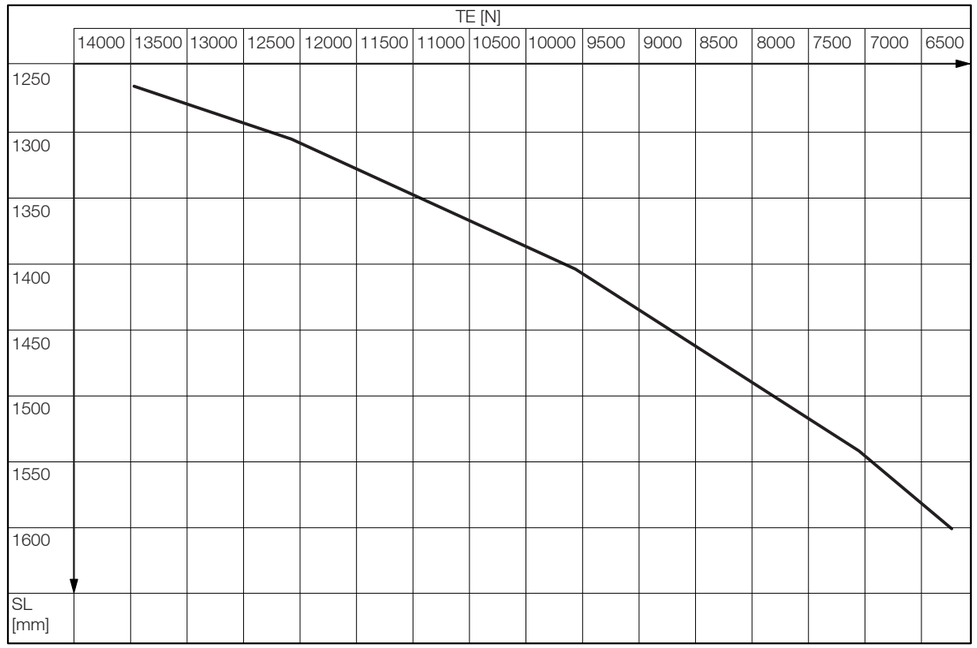
P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.074	12	3	72.55	0.041	5.7	112.5	1,654	300
0.149	8	3	72.55	0.067	9.4	137.4	2,020	300
0.207	6	3	72.55	0.090	12.7	141.9	2,087	300
0.306	4	3	72.55	0.133	18.6	143.0	2,103	300
			49.64	0.194	27.2	99.6	1,465	300
			40.91	0.235	33.0	82.8	1,217	300
			34.00	0.283	39.7	68.8	1,012	300
			30.55	0.315	44.2	61.8	909	300
			25.39	0.379	53.2	51.5	758	300
		2	20.22	0.475	66.8	41.4	609	300
			16.67	0.577	81.0	34.4	506	300
			12.44	0.772	108.5	25.8	379	300
0.455	2	3	72.55	0.277	39.0	101.6	1,494	300
			61.85	0.325	45.7	87.4	1,286	300
			49.64	0.405	56.9	70.8	1,040	300
			40.91	0.492	69.1	58.8	865	300
			34.00	0.592	83.1	48.9	719	300
			25.39	0.793	111.3	36.6	538	300
		2	20.22	0.995	139.7	29.4	433	300
			16.67	1.207	169.6	24.4	359	300
			12.44	1.617	227.1	18.3	269	300
			10.00	2.012	282.6	14.7	216	300
0.620	4	3	34.00	0.292	41.0	134.8	1,983	350
			30.55	0.325	45.7	121.1	1,781	350
			25.39	0.391	55.0	101.0	1,485	350
		2	20.22	0.491	69.0	81.2	1,194	350
			16.67	0.596	83.7	67.4	992	350
			12.44	0.798	112.1	50.5	743	350
			10.00	0.993	139.5	40.6	597	350
0.826	2	3	49.64	0.396	55.6	131.4	1,932	350
			40.91	0.481	67.5	109.2	1,606	350
			34.00	0.578	81.2	90.7	1,334	350
			25.39	0.775	108.8	68.0	999	350
		2	20.22	0.973	136.6	54.6	803	350
			16.67	1.180	165.7	45.4	667	350
			12.44	1.580	221.9	34.0	500	350
			10.00	1.967	276.2	27.3	402	350

P_N	Rated power
np	Number of poles
gs	Gear stages
i	Gear ratio
v	Rated velocity of the shell
n_A	Rated revolutions of the drum shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
SL_{min}	Min. shell length



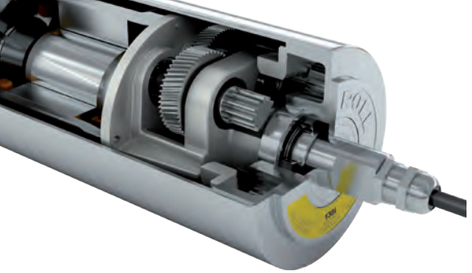
Belt Tension





Note: To get the right value of the maximum allowed belt tension, first find the maximum allowed TE value for the drum motor RPM. For motors with SL > 1,250 mm,check if the maximum allowed TE value for the SL is lower. In this case, use the lower value as maximum allowed TE value.

TE	Belt Tension
n_A	Rated revolutions of the drum shell
SL	Shell length



INTERROLL DRUM MOTOR 138i

Strong powerful drive for conveyors with high-duty cycles

Electrical data for 3-phase motors (Standard motors)

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.090	12	230	1.14	0.40	0.49	9.3	3.0	1.15	1.15	1.68	92.0	21	-
		400	0.66	0.40	0.49	9.3	3.0	1.15	1.15	1.68	92.0	-	36
0.180	8	230	1.21	0.64	0.58	9.3	2.6	1.10	1.10	1.55	64.0	25	-
		400	0.70	0.64	0.58	9.3	2.6	1.10	1.10	1.55	64.0	-	43
0.250	6	230	1.30	0.72	0.67	9.3	3.0	1.35	1.35	1.75	44.0	21	-
		400	0.75	0.72	0.67	9.3	3.0	1.35	1.35	1.75	44.0	-	36
0.370	4	230	1.68	0.79	0.70	5.6	3.3	1.55	1.55	1.95	26.5	18	-
		400	0.97	0.79	0.70	5.6	3.3	1.55	1.55	1.95	26.5	-	30
0.550	2	230	2.25	0.80	0.76	3.5	5.5	3.20	3.20	3.65	11.4	10	-
		400	1.30	0.80	0.76	3.5	5.5	3.20	3.20	3.65	11.4	-	18
0.750	4	230	3.29	0.80	0.71	9.9	3.4	2.10	2.10	2.45	9.7	13	-
		400	1.90	0.80	0.71	9.9	3.4	2.10	2.10	2.45	9.7	-	22
1.000	2	230	4.16	0.80	0.75	6.2	5.4	3.40	3.40	3.95	5.4	9	-
		400	2.40	0.80	0.75	6.2	5.4	3.40	3.40	3.95	5.4	-	16

Electrical data for 3-phase motors (Motors for applications with positive drive belts or no belts)

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.074	12	230	0.94	0.40	0.49	9.3	2.7	1.16	0.99	1.32	110.0	21	-
		400	0.55	0.40	0.49	9.3	2.7	1.16	0.99	1.32	110.0	-	36
0.149	8	230	0.94	0.64	0.61	9.3	2.4	1.32	1.16	1.40	98.0	29	-
		400	0.55	0.64	0.61	9.3	2.4	1.32	1.16	1.40	98.0	-	52
0.207	6	230	1.10	0.68	0.69	9.3	2.7	1.40	1.24	1.40	47.8	18	-
		400	0.64	0.68	0.69	9.3	2.7	1.40	1.24	1.40	47.8	-	31
0.306	4	230	1.26	0.79	0.77	5.6	3.0	1.34	1.16	1.49	33.1	16	-
		400	0.73	0.79	0.77	5.6	3.0	1.34	1.16	1.49	33.1	-	29
0.455	2	230	2.12	0.72	0.74	3.5	5.0	2.38	1.98	2.56	14.1	11	-
		400	1.23	0.72	0.74	3.5	5.0	2.38	1.98	2.56	14.1	-	19
0.620	4	230	2.66	0.79	0.73	9.9	3.1	1.07	1.40	1.24	11.8	12	-
		400	1.55	0.79	0.73	9.9	3.1	1.07	1.40	1.24	11.8	-	22
0.826	2	230	3.13	0.81	0.81	6.2	4.9	1.90	1.74	2.07	6.8	9	-
		400	1.82	0.81	0.81	6.2	4.9	1.90	1.74	2.07	6.8	-	15

P_N	Rated power
np	Number of poles
U_N	Rated voltage
I_N	Rated current
cos φ	Power factor
η	Efficiency
J_R	Rotor moment of inertia
I_S/I_N	Ratio of starting current to rated current
M_S/M_N	Ratio of starting torque to rated torque
M_P/M_N	Ratio of pull-up torque to rated torque
M_B/M_N	Ratio of break-down torque to rated torque
R_M	Phase resistance
$U_{SH\ delta}$	Preheating voltage in delta connection
$U_{SH\ star}$	Preheating voltage in star connection

Cable Specifications

Available cables for connectors (see also p 234):

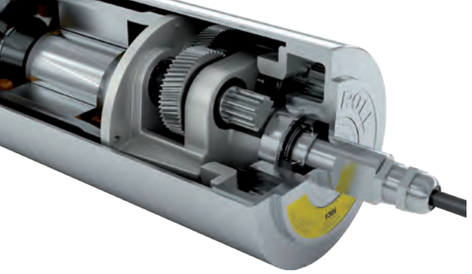
- Standard, screened
- Standard, unscreened
- Halogen-free, screened
- Halogen-free, unscreened

Halogen-free cables are not available for motors with UL certification.

Available length: 1 / 3 / 5 / 10 m

Connection Diagrams

For connection diagrams, see Planning Section on p 242.



Standard dimensions

Dimensions

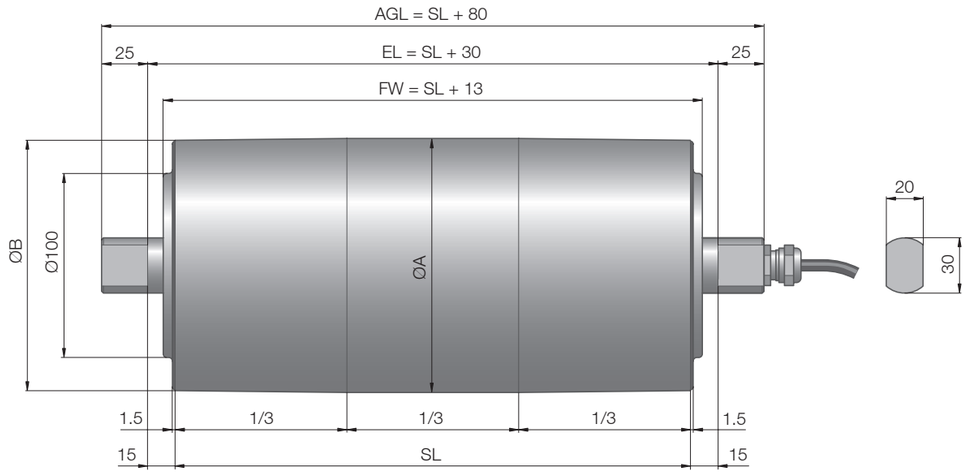


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
138i crowned shell	138.0	136.0
138i cylindrical shell	136.0	136.0
138i cylindrical shell + key	137.0	137.0

Connector dimensions

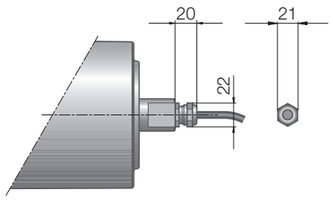


Fig.: Straight connector, brass/nickel

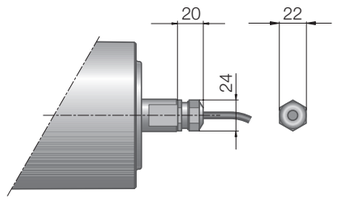


Fig.: Straight connector, stainless steel

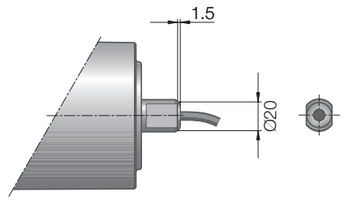


Fig.: Straight cable outlet, PU shaft plug

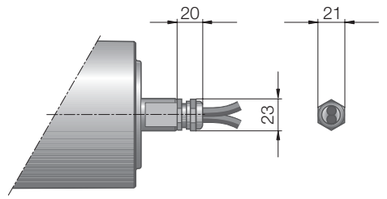


Fig.: Straight connector / Feedback device, brass/nickel

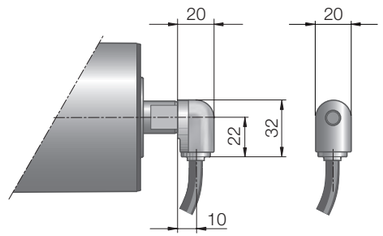


Fig.: Elbow connector, technopolymer

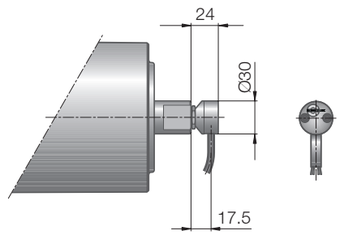


Fig.: Elbow connector, stainless steel

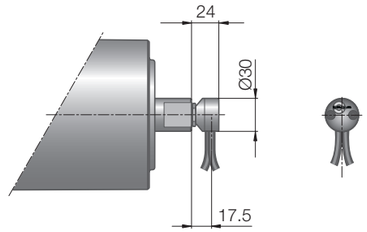


Fig.: Elbow connector / Feedback device, stainless steel

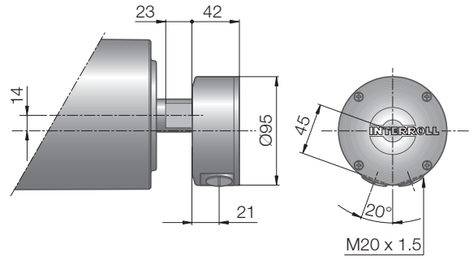
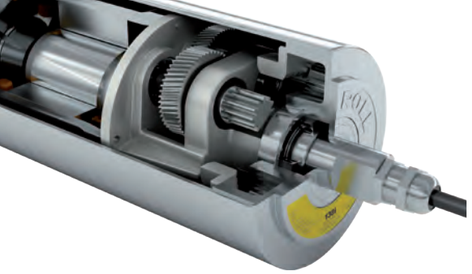


Fig.: Terminal box, stainless steel



INTERROLL DRUM MOTOR 138i

Strong powerful drive for conveyors with high-duty cycles

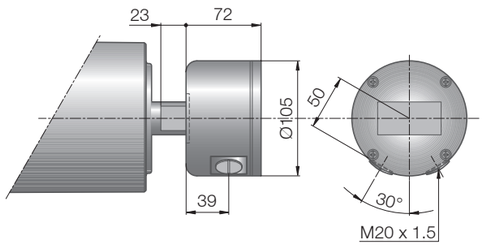


Fig.: Terminal box, technopolymer

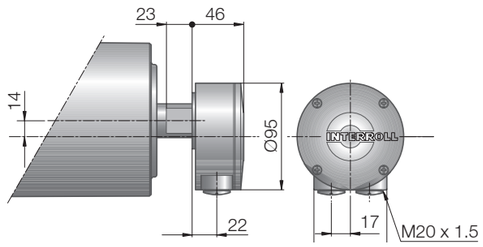


Fig.: Terminal box, aluminium

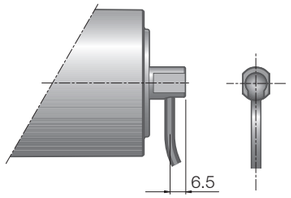


Fig.: Cable slot connector

Shafts for fixing

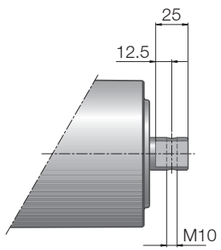


Fig.: Shaft, cross-drilled and threaded

Min. length with option

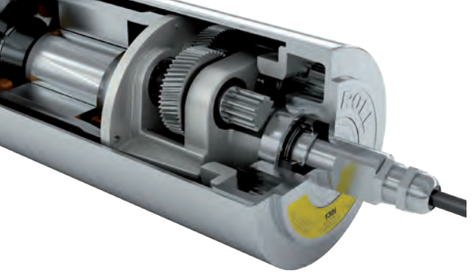
The following options increase the minimum length of the drum motor.

Option	Min. SL with option mm
Brake	Min. SL + 50
Encoder	Min. SL + 50
Cable slot connector	Min. SL + 50

Standard length and weight

Standard drum motor lengths and their weights:

Shell length SL in mm	300	350	400	450	500	550	600	650	700	750	800	850
Average weight in kg	14.50	15.70	16.90	18.10	19.30	20.50	21.70	22.90	24.10	25.30	26.50	27.70
Shell length SL in mm	900	950	1,000	1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450
Average weight in kg	28.90	33.11	34.43	35.75	37.07	38.39	39.71	41.03	42.35	43.67	44.99	46.31
Shell length SL in mm	1,500	1,550	1,600									
Average weight in kg	47.63	48.95	50.27									



INTERROLL DRUM MOTOR 165i

High-torque compact drive for conveyors with high-duty cycles

Product Description

Applications

The drum motor is outstandingly robust with a strong torque and can take a high radial load.

- ✓ Conveyors with high-duty cycles
- ✓ Logistics applications
- ✓ Airport and postal conveyors
- ✓ Warehouse loading conveyors
- ✓ Telescopic conveyors
- ✓ Agricultural plants
- ✓ Food processing
- ✓ Steel or plastic modular belt applications
- ✓ Dry, wet and wash-down applications

Characteristics

- ✓ Salt-water-resistant aluminium end housings
- ✓ 3-phase AC induction motor
- ✓ Dual voltage
- ✓ Integral thermal motor protection
- ✓ Steel-hardened helical spur gear
- ✓ Low noise
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible
- ✓ Reinforced shaft for SL above 1,000 mm

Technical Data

Electrical data	
Motor type	Asynchronous squirrel cage motor, IEC 34 (VDE 0530)
Insulation class of motor windings	Class F, IEC 34 (VDE 0530)
Voltage	230/400 V ±5 % (IEC 34/38) Most international voltages and frequencies can be supplied on request
Frequency	50 Hz
Internal shaft sealing system	Double-lipped, FPM
Protection rate	IP66
Thermal protection (see p 227)	Bi-metal switch
Operating modes (see p 214)	S1
Ambient temperature, 3-phase motor (see p 191)	+5 to +40 °C
Ambient temperature, 3-phase motor for applications with positive drive belts, or without belts (see p 191)	+5 to +25 °C
General technical data	
Max. shell length SL	1,750 mm

Order Information

Please refer to the Configurator at the end of the catalogue..

Material Versions

You can choose the following versions of drum body components and electrical connection. The versions depend on the material of the components.

Component	Version	Material				
		Aluminium	Mild steel	Stainless steel	Brass / Nickel	Techno-polymer
Shell	Crowned		✓	✓		
	Cylindrical		✓	✓		
	Cylindrical + key, for using sprockets		✓	✓		
End housing	Standard	✓		✓		
	With grooves and chain sprockets	✓		✓		
Shaft	Standard		✓	✓		
	Cross-drilled thread, M10		✓	✓		
External seal	Galvanised labyrinth		✓			
	Stainless steel Labyrinth			✓		
Electrical connector	Straight connector			✓	✓	
	Elbow connector			✓		✓
	Terminal box	✓		✓		✓

Please contact your Interroll customer consultant for further versions.

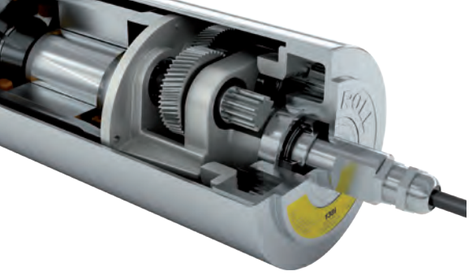
Options

- Lagging for friction drive belts, see p 116
- Lagging for plastic modular belts, see p 122
- Lagging for positive drive solid homogeneous belts, see p 126
- Sprockets for plastic modular belts, see p 128
- Backstops, see p 134
- Balancing, see p 135
- Electromagnetic brakes and rectifiers, see p 136
- Feedback Devices, see p 142
- Food-grade oil (EU, FDA), see p 238
- Low temperature oil, see p 238
- Labyrinth with FPM, see p 230
- cULus safety certifications, see p 233
- Non-horizontal mounting (more than ± 5°), see p 215

Note: Combination of encoder and electromagnetic brake is not possible.

Accessories

- Mounting brackets, see p 152
- Idler pulleys, see p 162 to p 165
- Conveyor rollers, see p 172



Product Range

The following tables give an overview of the possible motor versions. When ordering, please specify the version in accordance with the configurator at the end of the catalogue.

All data and values in this catalogue refer to 50 Hz operation.

Motor versions

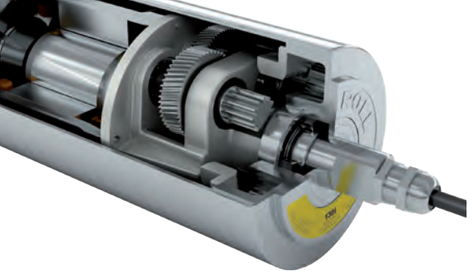
Mechanical data for 3-phase motors (Standard motors)

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.370	12	3	46.56	0.084	9.8	339.6	4,142	450
	8	3	62.37	0.100	11.1	300.6	3,666	400
			46.56	0.127	14.8	224.4	2,736	400
	4	3	62.37	0.189	22.0	158.5	1,933	400
			46.56	0.254	29.5	118.3	1,443	400
			39.31	0.300	35.0	99.9	1,218	400
			31.56	0.374	43.6	80.2	978	400
			24.60	0.480	55.9	62.5	762	400
		2	19.64	0.601	70.0	50.9	621	400
			14.66	0.806	93.8	38.0	464	400
			12.38	0.954	111.1	32.1	391	400
0.550	6	3	62.37	0.116	13.5	365.2	4,453	400
			46.56	0.156	18.1	272.6	3,324	400
0.750	6	3	46.56	0.156	18.1	371.6	4,532	450
	4	3	62.37	0.187	21.7	310.6	3,787	400
			46.56	0.250	29.1	231.8	2,827	400
			39.31	0.296	34.5	195.7	2,387	400
			31.56	0.369	42.9	157.1	1,916	400
			24.60	0.473	55.1	122.5	1,494	400
		2	19.64	0.593	69.0	99.8	1,217	400
			14.66	0.794	92.4	74.5	908	400
			12.38	0.940	109.5	62.9	767	400
1.100	4	3	46.56	0.243	28.4	348.8	4,254	400
			39.31	0.288	33.6	294.5	3,591	400
			31.56	0.359	41.8	236.4	2,883	400
			24.60	0.461	53.7	184.3	2,248	400
		2	19.64	0.577	67.2	150.1	1,831	400
			14.66	0.773	90.1	112.1	1,366	400
			12.38	0.916	106.7	94.6	1,154	400
	2	3	46.56	0.525	61.1	161.7	1,972	400
			39.31	0.621	72.4	136.5	1,665	400
			24.60	0.993	115.7	85.4	1,042	400
		2	19.64	1.244	144.9	69.6	849	400
			14.66	1.667	194.1	51.9	633	400
			12.38	1.974	229.9	43.9	535	400
			9.65	2.532	294.8	34.2	417	400
1.500	4	3	31.56	0.379	44.1	305.3	3,723	450
			24.60	0.486	56.6	238.0	2,903	450
		2	19.64	0.609	70.9	193.9	2,364	450
			14.66	0.816	95.0	144.7	1,765	450
			12.38	0.967	112.6	122.2	1,490	450
2.200	2	3	46.56	0.524	61.0	324.3	3,954	450
			39.31	0.620	72.2	273.8	3,339	450
			31.56	0.773	90.0	219.8	2,680	450
			24.60	0.991	115.4	171.3	2,089	450
		2	19.64	1.242	144.6	139.6	1,702	450
			14.66	1.664	193.8	104.2	1,270	450
			12.38	1.971	229.5	87.9	1,073	450
			9.65	2.527	294.3	68.6	836	450

Mechanical data for 3-phase motors (Motors for applications with positive drive belts or no belts)

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.306	12	3	46.56	0.083	9.8	280.8	3,467	450
	8	3	62.37	0.100	13.5	204.2	2,521	400
0.455	6	3	62.37	0.115	13.5	301.9	3,727	400
			46.56	0.154	18.1	225.3	2,782	400
0.620	6	3	46.56	0.158	18.6	299.9	3,703	450
	4	3	62.37	0.187	22.1	252.3	3,114	400
			46.56	0.251	29.6	188.3	2,325	400
			39.31	0.297	35.1	159.0	1,963	400
			31.56	0.370	43.7	127.6	1,576	400
			24.60	0.475	56.0	99.5	1,228	400
		2	19.64	0.595	70.2	81.0	1,000	400
			14.66	0.797	94.0	60.5	747	400
			12.38	0.945	111.4	51.1	630	400
0.909	4	3	46.56	0.240	28.4	288.2	3,558	400
			39.31	0.285	33.6	243.3	3,004	400
			31.56	0.355	41.8	195.3	2,411	400
			24.60	0.455	53.7	152.3	1,880	400
		2	19.64	0.570	67.2	124.0	1,531	400
			14.66	0.764	90.1	92.6	1,143	400
			12.38	0.905	106.7	78.2	965	400
	2	3	46.56	0.521	61.4	133.0	1,642	400
			39.31	0.617	72.8	112.3	1,386	400
			24.60	0.986	116.3	70.3	868	400
		2	19.64	1.235	145.6	57.2	707	400
			14.66	1.655	195.1	42.7	527	400
			12.38	1.960	231.1	36.1	445	400
			9.65	2.514	296.4	28.1	347	400
1.240	4	3	31.56	0.374	44.1	252.5	3,117	450
			24.60	0.480	56.6	196.8	2,430	450
		2	19.64	0.602	70.9	160.3	1,979	450
			14.66	0.806	95.0	119.7	1,477	450
			12.38	0.955	112.6	101.0	1,247	450
1.818	2	3	46.56	0.519	61.2	267.0	3,296	450
			39.31	0.615	72.5	225.4	2,783	450
			31.56	0.766	90.3	180.9	2,234	450
			24.60	0.983	115.9	141.1	1,741	450
		2	19.64	1.231	145.1	114.9	1,418	450
			14.66	1.649	194.4	85.8	1,059	450
			12.38	1.953	230.3	72.4	894	450
			9.65	2.505	295.3	56.5	697	450

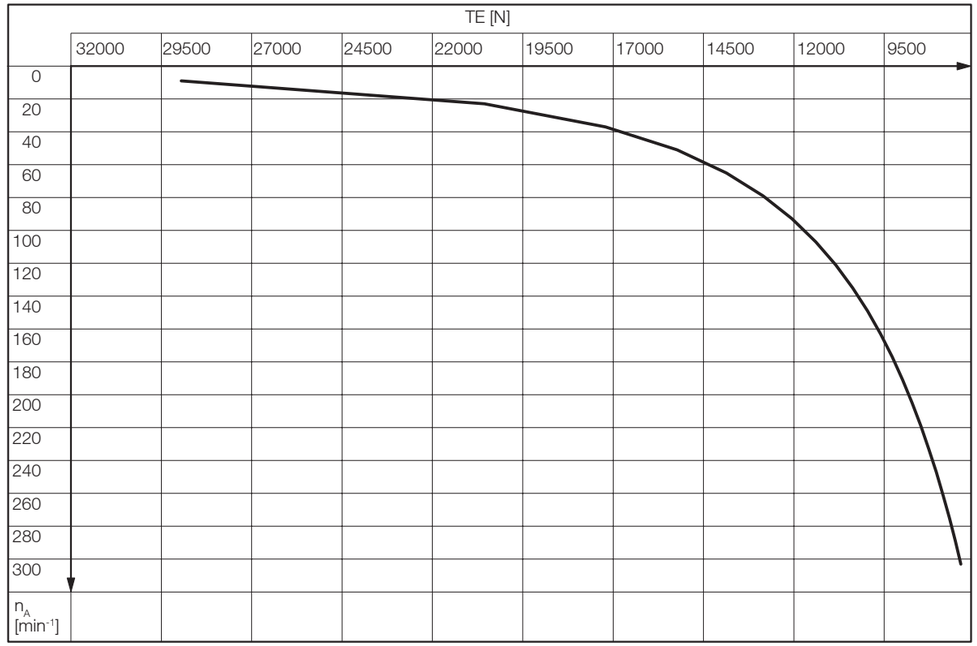
P_N	Rated power
np	Number of poles
gs	Gear stages
i	Gear ratio
v	Rated velocity of the shell
n_A	Rated revolutions of the drum shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
SL_{min}	Min. shell length

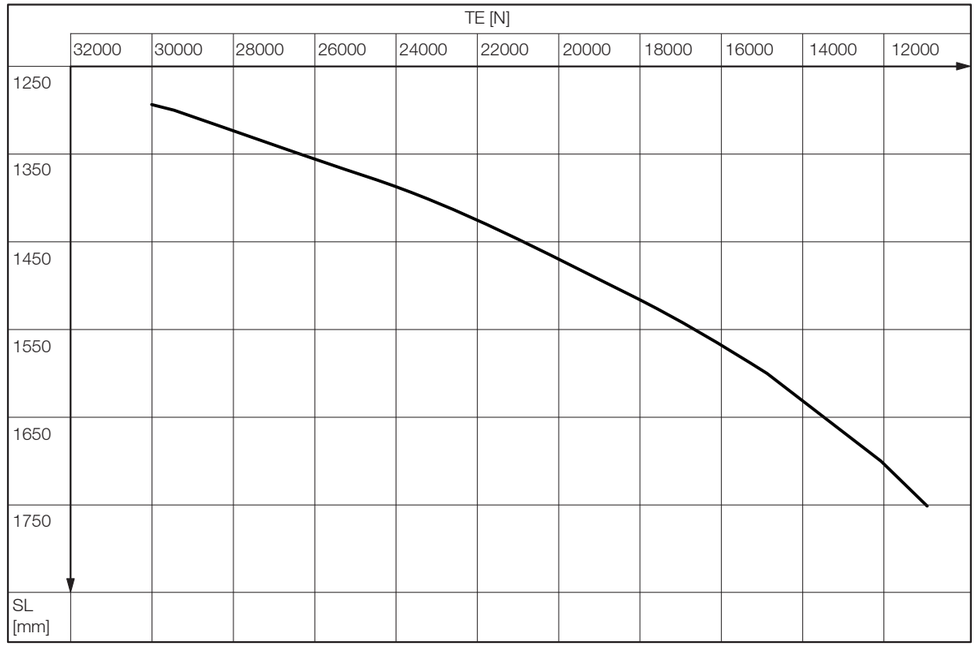


INTERROLL DRUM MOTOR 165i

High-torque compact drive for conveyors with high-duty cycles

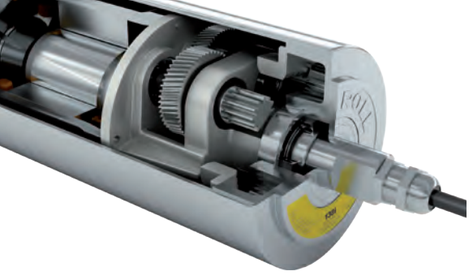
Belt Tension





TE	Belt Tension
n_A	Rated revolutions of the drum shell
SL	Shell length

Note: To get the right value of the maximum allowed belt tension, first find the maximum allowed TE value for the drum motor RPM. For motors with SL > 1,300 mm,check if the maximum allowed TE value for the SL is lower. In this case, use the lower value as maximum allowed TE value.



INTERROLL DRUM MOTOR 165i

High-torque compact drive for conveyors with high-duty cycles

Electrical data for 3-phase motors (Standard motors)

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.370	12	230	2.77	0.63	0.53	35.1	2.0	1.20	1.20	1.50	19.4	17	-
		400	1.60	0.63	0.53	35.1	2.0	1.20	1.20	1.50	19.4	-	29
	8	230	2.42	0.62	0.57	22.6	2.9	1.90	1.90	2.35	22.0	17	-
		400	1.50	0.62	0.57	22.6	2.9	1.90	1.90	2.35	22.0	-	31
	4	230	1.90	0.77	0.66	11.3	3.2	1.60	1.60	1.80	29.2	21	-
		400	1.10	0.77	0.66	11.3	3.2	1.60	1.60	1.80	29.2	-	37
0.550	6	230	2.77	0.69	0.72	22.6	3.4	1.40	1.40	1.65	19.5	19	-
		400	1.60	0.69	0.72	22.6	3.4	1.40	1.40	1.65	19.5	-	32
0.750	6	230	3.64	0.81	0.64	22.6	3.5	1.75	1.75	2.00	6.2	9	-
		400	2.10	0.81	0.64	22.6	3.5	1.75	1.75	2.00	6.2	-	16
	4	230	3.12	0.80	0.75	11.3	3.5	1.53	1.30	1.80	23.9	30	-
		400	1.80	0.80	0.75	11.3	3.5	1.53	1.30	1.80	23.9	-	52
1.100	4	230	4.85	0.82	0.69	11.3	3.5	1.50	1.30	1.70	7.2	14	-
		400	2.80	0.82	0.69	11.3	3.5	1.50	1.30	1.70	7.2	-	25
	2	230	4.16	0.86	0.77	7.6	5.2	3.15	2.10	3.42	2.9	5	-
		400	2.40	0.86	0.77	7.6	5.2	3.15	2.10	3.42	2.9	-	9
1.500	4	230	6.06	0.87	0.71	19.8	3.8	1.55	1.55	2.10	5.2	14	-
		400	3.50	0.87	0.71	19.8	3.8	1.55	1.55	2.10	5.2	-	24
2.200	2	230	7.88	0.86	0.81	7.6	5.3	2.60	2.60	3.20	6.2	21	-
		400	4.55	0.86	0.81	7.6	5.3	2.60	2.60	3.20	6.2	-	36

Electrical data for 3-phase motors (Motors for applications with positive drive belts or no belts)

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.306	12	230	2.51	0.62	0.49	35.1	1.8	1.74	1.57	1.98	22.4	17	-
		400	1.45	0.62	0.49	35.1	1.8	1.74	1.57	1.98	22.4	-	30
	8	230	1.97	0.62	0.62	22.6	2.9	1.24	1.16	1.40	28.0	17	-
		400	1.15	0.62	0.62	22.6	2.9	1.24	1.16	1.40	28.0	-	30
0.455	6	230	2.04	0.75	0.74	22.6	3.1	1.07	1.07	1.07	25.0	19	-
		400	1.18	0.75	0.74	22.6	3.1	1.07	1.07	1.07	25.0	-	33
0.620	6	230	3.30	0.78	0.60	22.6	3.2	1.17	1.16	1.20	6.2	8	-
		400	1.91	0.78	0.60	22.6	3.2	1.17	1.16	1.20	6.2	-	14
	4	230	2.55	0.80	0.76	11.3	3.6	1.26	1.07	1.49	14.4	15	-
		400	1.48	0.80	0.76	11.3	3.6	1.26	1.07	1.49	14.4	-	26
0.909	4	230	3.92	0.84	0.69	11.3	3.7	1.16	1.07	1.24	8.3	14	-
		400	2.27	0.84	0.69	11.3	3.7	1.16	1.07	1.24	8.3	-	24
	2	230	3.30	0.86	0.80	7.3	4.6	2.48	1.74	2.64	6.2	9	-
		400	1.91	0.86	0.80	7.3	4.6	2.48	1.74	2.64	6.2	-	15
1.240	4	230	4.94	0.80	0.78	19.8	3.5	1.18	1.07	1.21	6.2	12	-
		400	2.86	0.80	0.78	19.8	3.5	1.18	1.07	1.21	6.2	-	21
1.818	2	230	6.43	0.85	0.83	7.6	4.8	2.07	1.65	2.31	6.2	17	-
		400	3.73	0.85	0.83	7.6	4.8	2.07	1.65	2.31	6.2	-	29

P_N	Rated power
np	Number of poles
U_N	Rated voltage
I_N	Rated current
cos φ	Power factor
η	Efficiency
J_R	Rotor moment of inertia
I_S/I_N	Ratio of starting current to rated current
M_S/M_N	Ratio of starting torque to rated torque
M_P/M_N	Ratio of pull-up torque to rated torque
M_B/M_N	Ratio of break-down torque to rated torque
R_M	Phase resistance
$U_{SH\ delta}$	Preheating voltage in delta connection
$U_{SH\ star}$	Preheating voltage in star connection

Cable Specifications

Available cables for connectors (see also p 234):

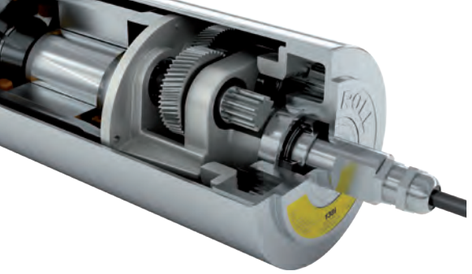
- Standard, screened
- Standard, unscreened
- Halogen-free, screened
- Halogen-free, unscreened

Halogen-free cables are not available for motors with UL certification above 1.5 kW power.

Available length: 1 / 3 / 5 / 10 m

Connection Diagrams

For connection diagrams, see Planning Section on p 242.



Standard dimensions

Dimensions

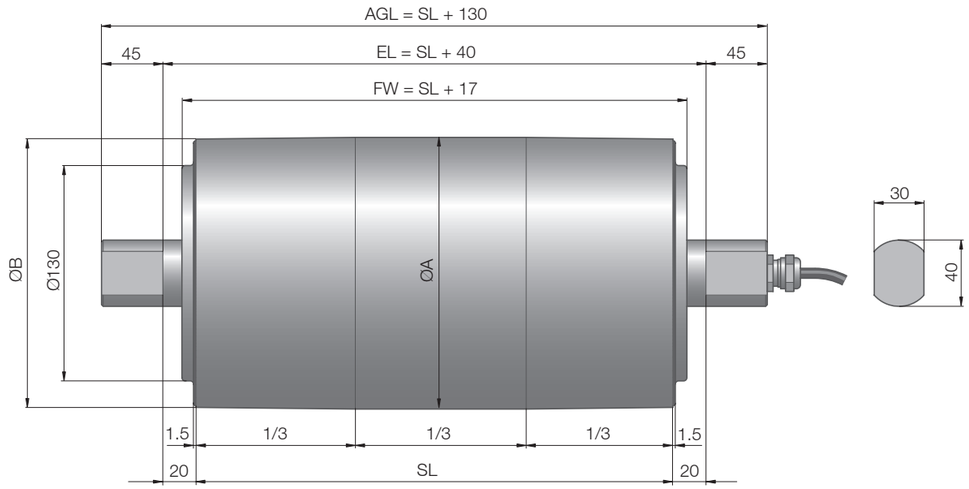


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
165i crowned shell	164.0	162.0
165i cylindrical shell	162.0	162.0
165i cylindrical shell + key	162.0	162.0

Connector dimensions

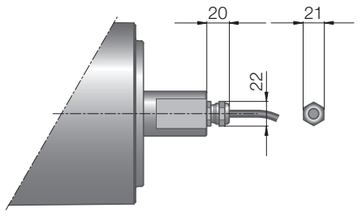


Fig.: Straight connector, brass/nickel

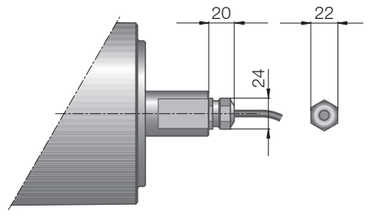


Fig.: Straight connector, stainless steel

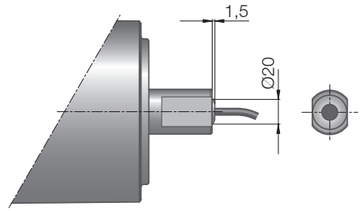


Fig.: Straight cable outlet, PU shaft plug

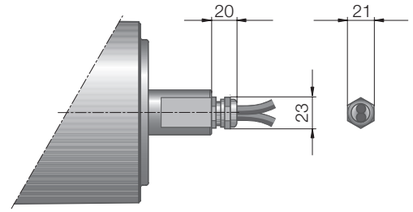


Fig.: Straight connector / Feedback device, brass/nickel

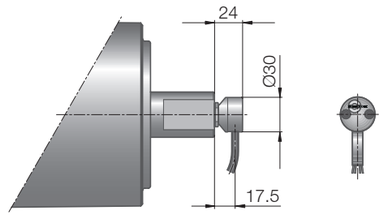


Fig.: Elbow connector, stainless steel

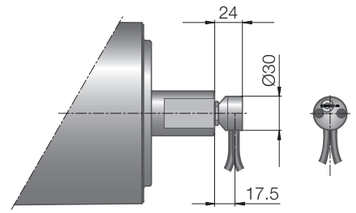


Fig.: Elbow connector / Feedback device, stainless steel

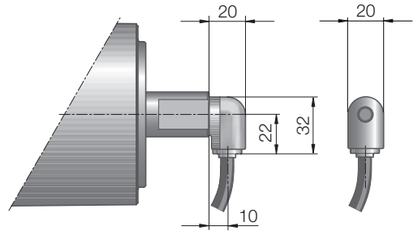


Fig.: Elbow connector, technopolymer

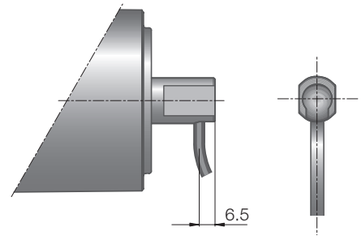
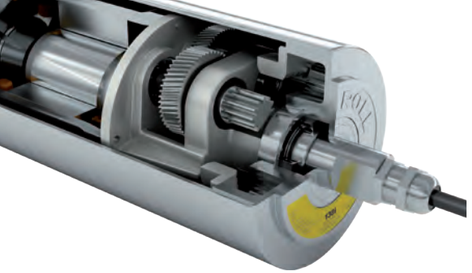


Fig.: Cable slot connector



INTERROLL DRUM MOTOR 165i

High-torque compact drive for conveyors with high-duty cycles

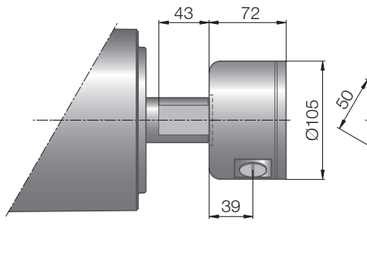


Fig.: Terminal box, technopolymer

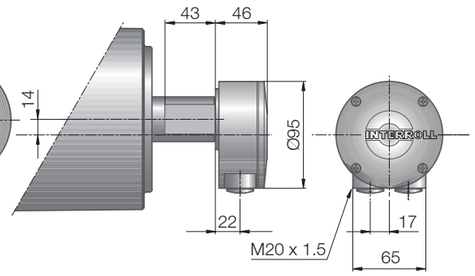


Fig.: Terminal box, aluminium

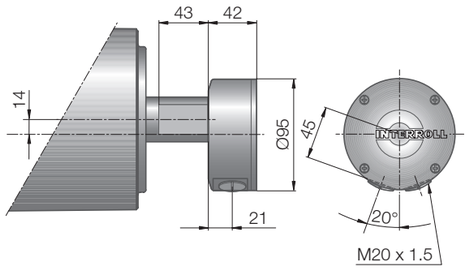


Fig.: Terminal box, stainless steel

Shafts for fixing

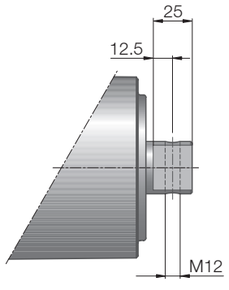


Fig.: Shaft, cross-drilled and threaded

For cross-drilled and threaded hole the shaft flat length is reduced from 45 to 25 mm.

Min. length with option

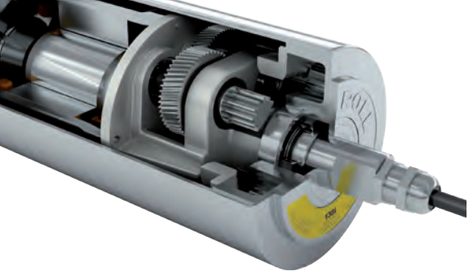
The following options increase the minimum length of the drum motor.

Option	Min. SL with option mm
Brake	Min. SL + 50
Encoder	Min. SL + 50
Cable slot connector	Min. SL + 50

Standard length and weight

Standard drum motor lengths and their weights:

Shell length SL in mm	400	450	500	550	600	650	700	750	800	850	900
Average weight in kg	35.00	36.90	38.80	40.70	42.60	44.50	46.40	48.30	50.20	52.10	54.00
Shell length SL in mm	950	1,000	1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450
Average weight in kg	55.90	57.80	65.67	67.76	69.85	71.94	74.03	76.12	78.21	80.30	82.39
Shell length SL in mm	1,500	1,550	1,600	1,650	1,700	1,750					
Average weight in kg	84.48	86.57	88.66	90.75	92.84	94.93					



INTERROLL DRUM MOTOR 217i

High torque compact drive for heavy-duty conveyors

Product Description

Applications

This drum motor is typically used for heavy-duty handling applications.

- ✓ Conveyors with heavy loads
- ✓ Belts with side walls or cross cleats
- ✓ Logistics applications
- ✓ Airport and postal conveyors
- ✓ Warehouse loading conveyors
- ✓ Telescopic conveyors
- ✓ Agricultural plants
- ✓ Food processing
- ✓ Dry, wet and wash-down applications

Characteristics

- ✓ Salt-water-resistant aluminium end housings
- ✓ 3-phase AC induction motor
- ✓ Dual voltage
- ✓ Integral thermal motor protection
- ✓ Steel-hardened helical spur gear
- ✓ Low noise
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible
- ✓ Reinforced shaft for SL above 1,200 mm

Technical Data

Electrical data	
Motor type	Asynchronous squirrel cage motor, IEC 34 (VDE 0530)
Insulation class of motor windings	Class F, IEC 34 (VDE 0530)
Voltage	230/400 V ±5 % (IEC 34/38) Most international voltages and frequencies can be supplied on request
Frequency	50 Hz
Internal shaft sealing system	Double-lipped, FPM
Protection rate	IP66
Thermal protection (see p 245)	Bi-metal switch
Operating modes (see p 230)	S1
Ambient temperature, 3-phase motor (see p 207)	+5 to +40 °C
Ambient temperature, 3-phase motor for applications with positive drive belts, or without belts (see p 207)	+5 to +25 °C
General technical data	
Max. shell length SL	1,750 mm

Order Information

Please refer to the Configurator at the end of the catalogue..

Material Versions

You can choose the following versions of drum body components and electrical connection. The versions depend on the material of the components.

Component	Version	Material				
		Aluminium	Mild steel	Stainless steel	Brass / Nickel	Techno-polymer
Shell	Crowned		✓	✓		
	Cylindrical		✓	✓		
End housing	Standard	✓		✓		
	With grooves and chain sprockets			✓		
Shaft	Standard		✓	✓		
	Cross-drilled thread, M10		✓	✓		
External seal	Galvanised labyrinth		✓			
	Stainless steel Labyrinth			✓		
Electrical connector	Straight connector			✓	✓	
	Elbow connector			✓		✓
	Terminal box	✓		✓		✓

Please contact your Interroll customer consultant for further versions.

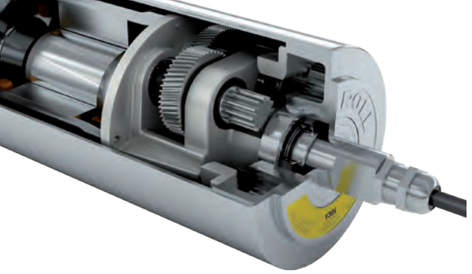
Options

- Lagging for friction drive belts, see p 116
- Lagging for plastic modular belts, see p 122
- Lagging for positive drive solid homogeneous belts, see p 126
- Sprockets for plastic modular belts, see p 128
- Backstops, see p 134
- Balancing, see p 135
- Electromagnetic brakes and rectifiers, see p 136
- Feedback Devices, see p 142
- Food-grade oil (EU, FDA), see p 238
- Low temperature oil, see p 238
- Labyrinth with FPM, see p 230
- cULus safety certifications, see p 233
- Non-horizontal mounting (more than ± 5°), see p 215

Note: Combination of encoder and electromagnetic brake is not possible.

Accessories

- Mounting brackets, see p 152
- Idler pulleys, see p 162 to p 165
- Conveyor rollers, see p 172



INTERROLL DRUM MOTOR 217i

High torque compact drive for heavy-duty conveyors

Product Range

The following tables give an overview of the possible motor versions. When ordering, please specify the version in accordance with the configurator at the end of the catalogue.

All data and values in this catalogue refer to 50 Hz operation.

Motor versions

Mechanical data for 3-phase motors (Standard motors)

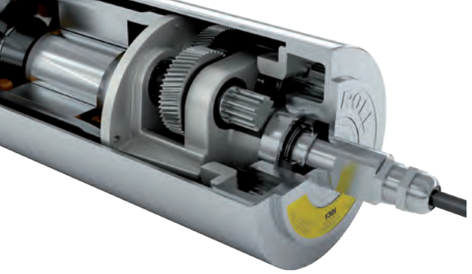
P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.370	8	3	62.37	0.126	11.1	300.6	2,764	400
0.550	6	3	62.37	0.154	13.5	365.2	3,358	400
			46.56	0.207	18.1	272.6	2,506	400
0.750	4	3	62.37	0.247	21.7	310.6	2,856	400
1.100	8	2	31.11	0.254	22.3	451.8	4,154	500
	4	3	46.56	0.323	28.4	348.8	3,207	400
			39.31	0.382	33.6	294.5	2,708	400
			31.56	0.476	41.8	236.4	2,174	400
			24.60	0.611	53.7	184.3	1,695	400
		2	19.64	0.766	67.2	150.1	1,380	400
			14.66	1.026	90.1	112.1	1,030	400
			12.38	1.215	106.7	94.6	870	400
	2	3	24.60	1.317	115.7	85.4	786	400
		2	19.64	1.650	144.9	69.6	640	400
			14.66	2.211	194.1	51.9	478	400
			12.38	2.618	229.9	43.9	403	400
			9.65	3.357	294.8	34.2	314	400
1.500	6	2	27.53	0.397	34.9	394.5	3,628	500
			20.10	0.544	47.8	288.1	2,649	500
			16.80	0.651	57.1	240.7	2,214	500
	4	2	31.11	0.516	45.3	303.6	2,791	550
			27.53	0.583	51.2	268.7	2,470	500
			20.10	0.799	70.1	196.2	1,804	500
			16.80	0.956	83.9	163.9	1,507	500
			12.53	1.281	112.5	122.3	1,124	500
2.200	6	2	16.80	0.633	55.6	362.9	3,337	500
	4	2	31.11	0.520	45.6	442.2	4,066	500
			27.53	0.587	51.6	391.4	3,599	500
			20.10	0.804	70.6	285.7	2,627	500
			16.80	0.963	84.5	238.8	2,196	500
			12.53	1.290	113.3	178.1	1,638	500
	2	2	27.53	1.156	101.5	198.9	1,829	500
			20.10	1.583	139.0	145.2	1,335	500
			16.80	1.894	166.3	121.3	1,116	500
			12.53	2.539	223.0	90.5	832	500
3.000	4	2	27.53	0.587	51.6	533.6	4,907	500
			20.10	0.804	70.6	389.6	3,583	500
			16.80	0.963	84.5	325.6	2,994	500
			12.53	1.290	113.3	242.9	2,233	500
	2	2	27.53	1.163	102.1	269.5	2,478	500
			20.10	1.593	139.9	196.7	1,809	500
			16.80	1.906	167.4	164.4	1,512	500
			12.53	2.555	224.4	122.6	1,128	500

Note: Motors with a SL_{min} of 500 or 550 mm may also be used for applications with positive drive belts or no belts.

Mechanical data for 3-phase motors (Motors for applications with positive drive belts or no belts)

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	SL_{min} mm
0.306	8	3	62.37	0.152	13.5	204.2	1,895	400
0.455	6	3	62.37	0.153	13.5	301.9	2,802	400
			46.56	0.205	18.1	225.3	2,091	400
0.620	4	3	62.37	0.249	22.1	252.3	2,341	400
0.909	4	3	46.56	0.320	28.4	288.2	2,674	400
			39.31	0.379	33.6	243.3	2,258	400
			31.56	0.472	41.8	195.3	1,813	400
			24.60	0.605	53.7	152.3	1,413	400
		2	19.64	0.759	67.2	124.0	1,151	400
			14.66	1.016	90.1	92.6	859	400
			12.38	1.204	106.7	78.2	725	400
	2	3	24.60	1.312	116.3	70.3	652	400
		2	19.64	1.643	145.6	57.2	531	400
			14.66	2.202	195.1	42.7	396	400
			12.38	2.608	231.1	36.1	335	400
			9.65	3.344	296.4	28.1	261	400

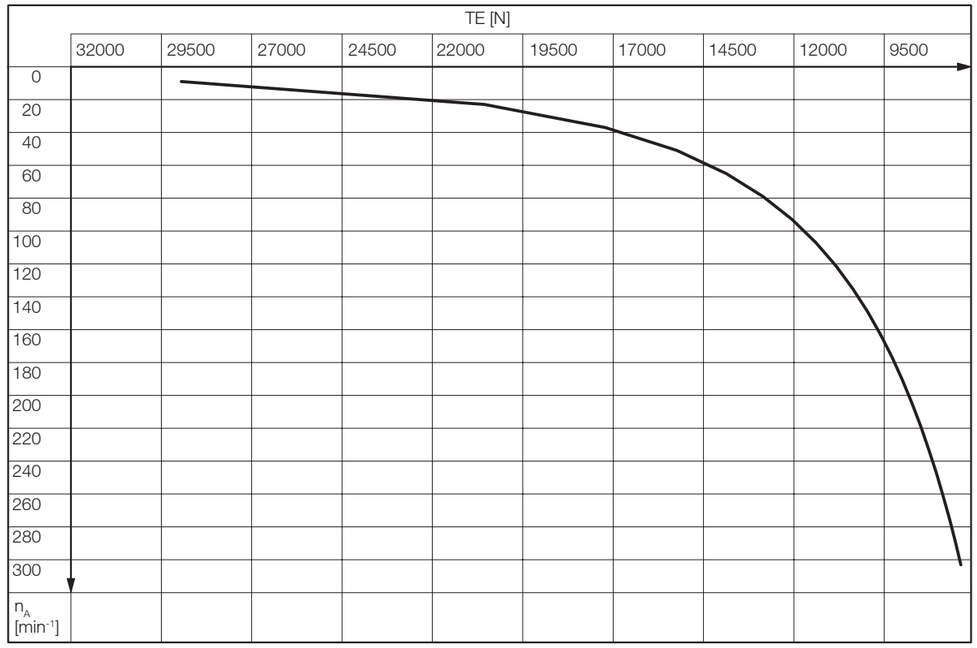
P_N	Rated power
np	Number of poles
gs	Gear stages
i	Gear ratio
v	Rated velocity of the shell
n_A	Rated revolutions of the drum shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
SL_{min}	Min. shell length



INTERROLL DRUM MOTOR 217i

High torque compact drive for heavy-duty conveyors

Belt Tension

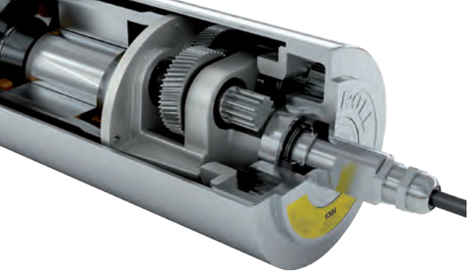


TE	Belt Tension
n_A	Rated revolutions of the drum shell
SL	Shell length

Note: To get the right value of the maximum allowed belt tension, find the maximum allowed TE value for the drum motor RPM. The TE value for SL does not need to be considered for standard 217i.

Electrical data for 3-phase motors (Standard motors)

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm^2	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.370	8	230	2.42	0.62	0.57	22.6	2.9	1.90	1.90	2.35	22.0	17	-
		400	1.50	0.62	0.57	22.6	2.9	1.90	1.90	2.35	22.0	-	31
0.550	6	230	2.77	0.69	0.72	22.6	3.4	1.40	1.40	1.65	19.5	19	-
		400	1.60	0.69	0.72	22.6	3.4	1.40	1.40	1.65	19.5	-	32
0.750	4	230	3.12	0.80	0.75	11.3	3.5	1.53	1.30	1.80	23.9	30	-
		400	1.80	0.80	0.75	11.3	3.5	1.53	1.30	1.80	23.9	-	52
1.100	8	230	5.54	0.81	0.61	86.0	4.5	1.80	1.70	2.20	6.3	14	-
		400	3.20	0.81	0.61	86.0	4.5	1.80	1.70	2.20	6.3	-	24
	4	230	4.85	0.82	0.69	11.3	3.5	1.50	1.30	1.70	7.2	14	-
		400	2.80	0.82	0.69	11.3	3.5	1.50	1.30	1.70	7.2	-	25
	2	230	4.16	0.86	0.77	7.6	5.2	3.15	2.10	3.42	2.9	5	-
		400	2.40	0.86	0.77	7.6	5.2	3.15	2.10	3.42	2.9	-	9
1.500	6	230	6.93	0.82	0.66	86.0	4.8	2.10	1.90	2.50	4.3	12	-
		400	4.00	0.82	0.66	86.0	4.8	2.10	1.90	2.50	4.3	-	21
	4	230	6.41	0.87	0.67	49.6	5.5	2.20	1.80	2.50	3.6	10	-
		400	3.70	0.87	0.67	49.6	5.5	2.20	1.80	2.50	3.6	-	17
2.200	6	230	9.87	0.80	0.70	86.0	5.0	2.10	1.90	2.50	3.6	14	-
		400	5.70	0.80	0.70	86.0	5.0	2.10	1.90	2.50	3.6	-	25
	4	230	9.01	0.87	0.70	60.0	5.9	2.40	2.30	2.90	3.5	14	-
		400	5.20	0.87	0.70	60.0	5.9	2.40	2.30	2.90	3.5	-	24
	2	230	8.83	0.88	0.71	26.0	6.4	2.60	2.30	3.02	3.0	11	-
		400	5.10	0.88	0.71	26.0	6.4	2.60	2.30	3.02	3.0	-	20
3.000	4	230	12.12	0.82	0.76	46.9	5.0	2.40	2.30	2.90	1.9	9	-
		400	7.00	0.82	0.76	46.9	5.0	2.40	2.30	2.90	1.9	-	16
	2	230	11.52	0.82	0.80	38.1	6.5	2.60	2.40	3.40	1.6	7	-
		400	6.65	0.82	0.80	38.1	6.5	2.60	2.40	3.40	1.6	-	13



INTERROLL DRUM MOTOR 217i

High torque compact drive for heavy-duty conveyors

Electrical data for 3-phase motors (Motors for applications with positive drive belts or no belts)

P_N kW	np	U_N V	I_N A	cos φ	η	J_R kgcm²	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	R_M Ω	$U_{SH\ delta}$ V DC	$U_{SH\ star}$ V DC
0.306	8	230	1.97	0.62	0.62	22.6	2.9	1.24	1.16	1.40	28.0	17	-
		400	1.15	0.62	0.62	22.6	2.9	1.24	1.16	1.40	28.0	-	30
0.455	6	230	2.04	0.75	0.74	22.6	3.1	1.07	1.07	1.07	25.0	19	-
		400	1.18	0.75	0.74	22.6	3.1	1.07	1.07	1.07	25.0	-	33
0.620	4	230	2.55	0.80	0.76	11.3	3.6	1.26	1.07	1.49	14.4	15	-
		400	1.48	0.80	0.76	11.3	3.6	1.26	1.07	1.49	14.4	-	26
0.909	4	230	3.92	0.84	0.69	11.3	3.7	1.16	1.07	1.24	8.3	14	-
		400	2.27	0.84	0.69	11.3	3.7	1.16	1.07	1.24	8.3	-	24
	2	230	3.30	0.86	0.80	7.3	4.6	2.48	1.74	2.64	6.2	9	-
		400	1.91	0.86	0.80	7.3	4.6	2.48	1.74	2.64	6.2	-	15

P_N	Rated power
np	Number of poles
U_N	Rated voltage
I_N	Rated current
cos φ	Power factor
η	Efficiency
J_R	Rotor moment of inertia
I_S/I_N	Ratio of starting current to rated current
M_S/M_N	Ratio of starting torque to rated torque
M_P/M_N	Ratio of pull-up torque to rated torque
M_B/M_N	Ratio of break-down torque to rated torque
R_M	Phase resistance
$U_{SH\ delta}$	Preheating voltage in delta connection
$U_{SH\ star}$	Preheating voltage in star connection

Cable Specifications

Available cables for connectors (see also p 234):

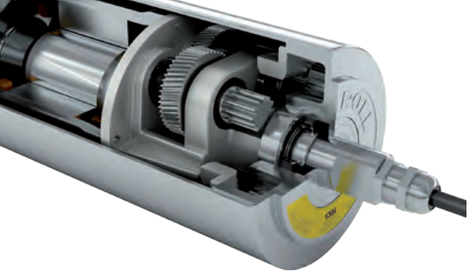
- Standard, screened
- Standard, unscreened
- Halogen-free, screened
- Halogen-free, unscreened

Halogen-free cables are not available for motors with UL certification above 1.5 kW power.

Available length: 1 / 3 / 5 / 10 m

Connection Diagrams

For connection diagrams, see Planning Section on p 242.



INTERROLL DRUM MOTOR 217i

High torque compact drive for heavy-duty conveyors

Standard dimensions

Dimensions

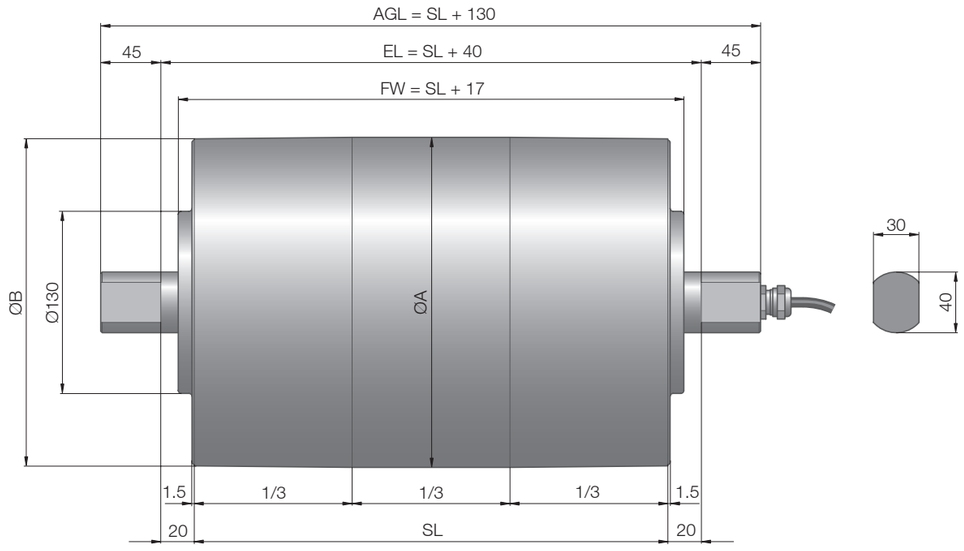


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
217i crowned shell	217.5	215.5
217i cylindrical shell	215.5	215.5

Connector dimensions

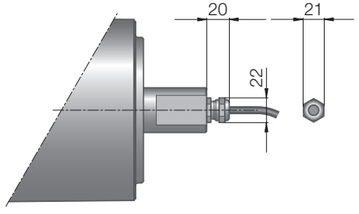


Fig.: Straight connector, brass/nickel

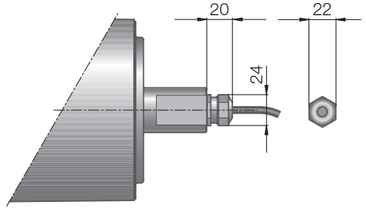


Fig.: Straight connector, stainless steel

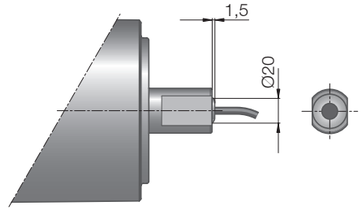


Fig.: Straight cable outlet, PU shaft plug

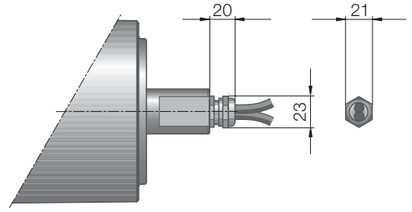


Fig.: Straight connector / Feedback device, brass/ nickel

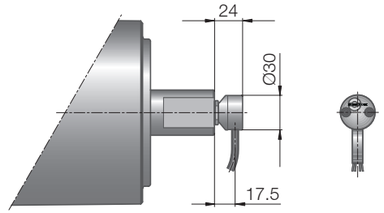


Fig.: Elbow connector, stainless steel

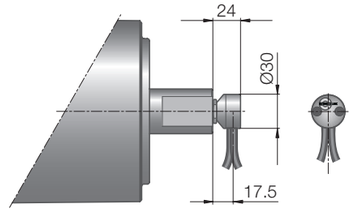


Fig.: Elbow connector / Feedback device, stainless steel

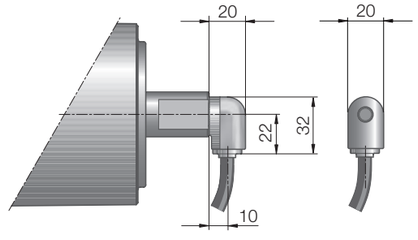


Fig.: Elbow connector, technopolymer

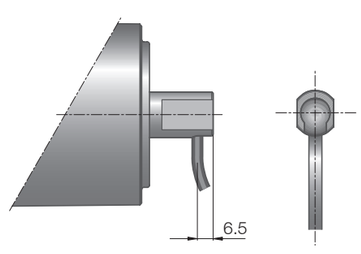
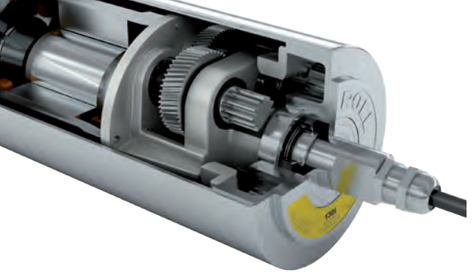


Fig.: Cable slot connector



INTERROLL DRUM MOTOR 217i

High torque compact drive for heavy-duty conveyors

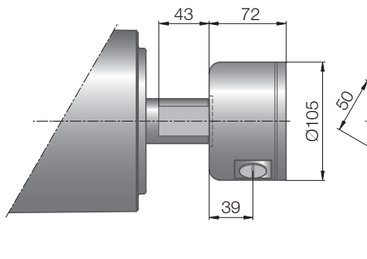


Fig.: Terminal box, technopolymer

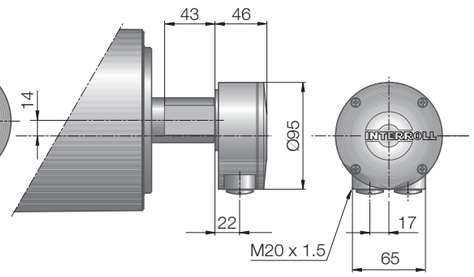


Fig.: Terminal box, aluminium

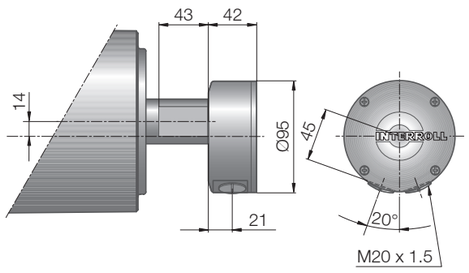


Fig.: Terminal box, stainless steel

Shafts for fixing

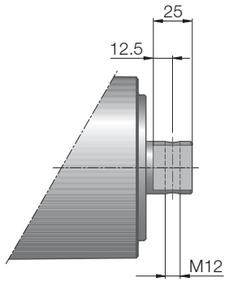


Fig.: Shaft, cross-drilled and threaded

For cross-drilled and threaded hole the shaft flat length is reduced from 45 to 25 mm.

Min. length with option

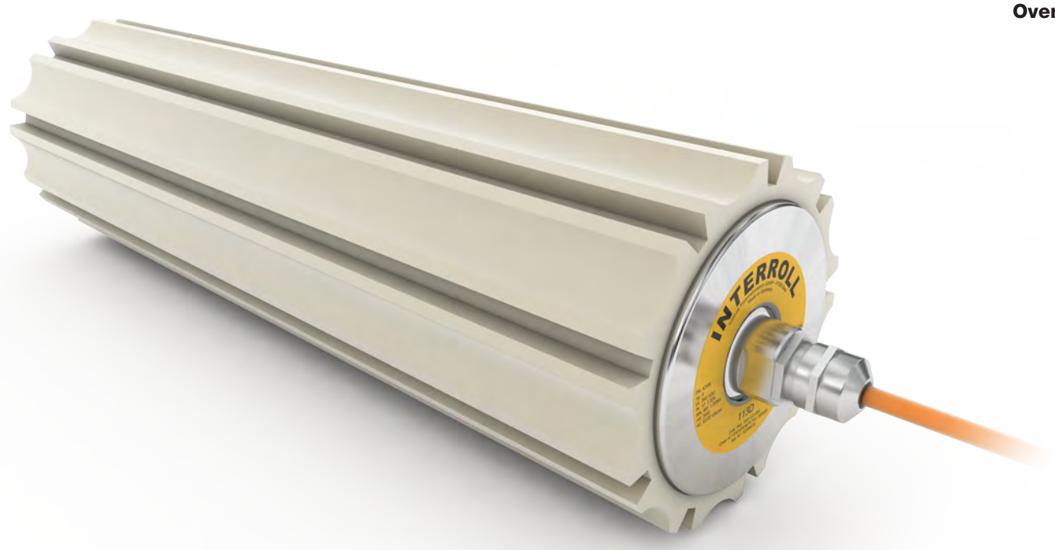
The following options increase the minimum length of the drum motor.

Option	Min. SL with option mm
Brake	Min. SL + 50
Encoder	Min. SL + 50
Cable slot connector	Min. SL + 50

Standard length and weight

Standard drum motor lengths and their weights:

Shell length SL in mm	400	450	500	550	600	650	700	750	800	850	900
Average weight in kg	46.50	47.80	65.00	70.00	72.00	74.00	76.00	78.00	80.00	82.00	84.00
Shell length SL in mm	950	1,000	1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450
Average weight in kg	86.00	88.00	99.00	101.20	103.40	105.60	107.80	110.00	112.20	114.40	116.60
Shell length SL in mm	1,500	1,550	1,600	1,650	1,700	1,750					
Average weight in kg	118.80	121.00	123.20	125.40	127.60	129.80					



OVERVIEW OF STANDARD SYNCHRONOUS DRUM MOTORS

	80D	80D oil-free	113D	113D oil-free
Motor technology	Synchron	Synchron	Synchron	Synchron
Diameter	81.5 mm	81.5 mm	113.5 mm	113.5 mm
Gear material	Steel	Steel	Steel	Steel
Rated power	0.145 to 0.700 kW	0.08 to 0.425 kW	0.145 to1.100 kW	0.080 bis 0.670 kW
Rated torque	2.2 to 59.8 Nm	1.3 to 35.1 Nm	2.2 to 59.8 Nm	1.2 bis 32.7 Nm
Max. Belt pull	1467 N	862 N	1054 N	576 N
Velocity of the shell	0.08 to 2.56m/s	0.08 to 2.56m/s	0.11 to 3.56 m/s	0.11 bis 3.56 m/s
Shell length SL	185 to 900 mm	185 to 900 mm	185 to 900 mm	185 bis 900 mm
Friction drive belt	✓	✓	✓	✓
Positive drive belt	✓	✓	✓	✓
Without belt	✓	✓	✓	✓
	p 94		*p 104*	

INTERROLL DRUM MOTOR 80D

Compact and robust drive for smart belt conveyors with high dynamics

Product Description

Applications

The drum motor is perfect for high dynamic applications, food conveyors, smart belt and many servo conveyor belt applications.

- ✓ Small feed conveyors with high-duty cycles
- ✓ High performance packaging conveyors
- ✓ Dynamic weighing equipment
- ✓ Smart belts
- ✓ Pick and place applications
- ✓ Food processing (EHEDG)
- ✓ Dry, wet and wash-down applications

Characteristics

- ✓ Stainless steel housings
- ✓ 3-phase AC synchronous permanent magnet motor
- ✓ High torque
- ✓ Integral motor protection
- ✓ Steel-hardened planetary gear
- ✓ Wide variable speed range
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ High efficiency
- ✓ New! Oil-free variants now available

Note: Synchronous drum motors must be connected to a drive controller and not directly to the mains supply. For feedback or positioning applications use a servo-driver.

Technical Data

Electrical data	
Motor type	AC Synchronous permanent magnet motor
Insulation class of motor windings	Class F, IEC 34 (VDE 0530)
Voltage	230/400 V Special voltage on request
Internal shaft sealing system	Double-lipped, FPM
Protection rate	IP69K
Thermal protection (see p 227)	Bi-metal switch
Operating modes (see p 214)	S1
Ambient temperature, 3-phase motor (see p 191)	+5 to +40 °C
General technical data	
Max. shell length SL	900 mm

Order Information

Please refer to the Configurator at the end of the catalogue..

Material Versions

You can choose the following versions of drum body components and electrical connection. The versions depend on the material of the components.

Component	Version	Material			
		Mild steel	Stainless steel	Brass / Nickel	Techno-polymer
Shell	Crowned	✓	✓		
	Cylindrical	✓	✓		
	Cylindrical + key, for using sprockets	✓	✓		
End housing	Standard		✓		
Shaft	Standard		✓		
External seal	PTFE				
Electrical connector	Straight connector		✓	✓	
	Straight cable outlet				✓
	Elbow connector		✓		✓
	Straight hygienic connector		✓		

Please contact your Interroll customer consultant for further versions.

Options

- Lagging for friction drive belts, see p 116
- Lagging for plastic modular belts, see p 122
- Lagging for positive drive solid homogeneous belts belts, see p 126
- Sprockets for plastic modular belts, see p 128
- Feedback devices, see p 142
- Food-grade oil (EU, FDA), see p 238
- Low temperature oil, see p 238
- cULus safety certifications, see p 233
- Non-horizontal mounting (more than ± 5°), see p 215
- Oil-free variants
- Reinforced axle see p 98

Accessories

- Plummer block bracket, see p 160
- Idler pulleys, see p 162 to p 165
- Conveyor rollers, see p 172

INTERROLL DRUM MOTOR 80D

Compact and robust drive for smart belt conveyors with high dynamics

Product Range

The following tables give an overview of the possible motor versions. When ordering, please specify the version in accordance with the configurator at the end of the catalogue.

All data and values in this catalogue refer to 200 Hz or 300 Hz operation.

Motor versions

Mechanical data for synchronous motor 80D

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	Overload factor	SL_{min} mm
0.145	8	1	5	2.560	600.0	2.2	54	3	185
			8	1.600	375.0	3.5	86	3	185
		2	12	1.067	250.0	5.1	125	3	200
			16	0.800	187.5	6.8	167	3	200
			20	0.640	150.0	8.5	209	3	200
			25	0.512	120.0	10.6	260	3	200
			32	0.400	93.8	13.6	334	3	200
			40	0.320	75.0	17.0	417	3	200
		3	60	0.213	50.0	24.6	604	3	215
			80	0.160	37.5	32.9	807	2.9	215
			100	0.128	30.0	41.1	1009	2.3	215
			120	0.107	25.0	44.9	1102	2.1	215
			160	0.080	18.8	59.8	1467	1.6	215
0.298	8	1	5	2.560	600.0	4.5	111	3	235
			8	1.600	375.0	7.2	177	3	235
		2	12	1.067	250.0	10.5	257	3	250
			16	0.800	187.5	14.0	343	3	250
			20	0.640	150.0	17.5	428	3	250
			25	0.512	120.0	21.8	535	3	250
			32	0.400	93.8	27.9	685	3	250
			40	0.320	75.0	34.9	857	2.8	250
		3	60	0.213	50.0	50.7	1243	1.9	265
0.425	8	1	5	2.560	600.0	6.4	158	3	250
			8	1.600	375.0	10.3	252	2.8	250
		2	12	1.067	250.0	14.9	367	3	265
			16	0.800	187.5	19.9	489	3	265
			20	0.640	150.0	24.9	611	3	265
			25	0.512	120.0	31.1	764	3	265
			32	0.400	93.8	39.8	977	2.4	265
			40	0.320	75.0	49.8	1222	1.9	265
0.700	6	1	8	2.400	562.5	11.3	277	2.6	250
		2	12	1.600	375.0	16.4	402	2.7	265
			16	1.200	281.3	21.9	537	2.7	265
			20	0.960	225.0	27.3	671	2.7	265
			25	0.768	180.0	34.2	838	2.7	265
			32	0.600	140.6	43.7	1073	2.2	265
			40	0.480	112.5	54.7	1341	1.8	265

Mechanical data for synchronous motor 80D oil-free

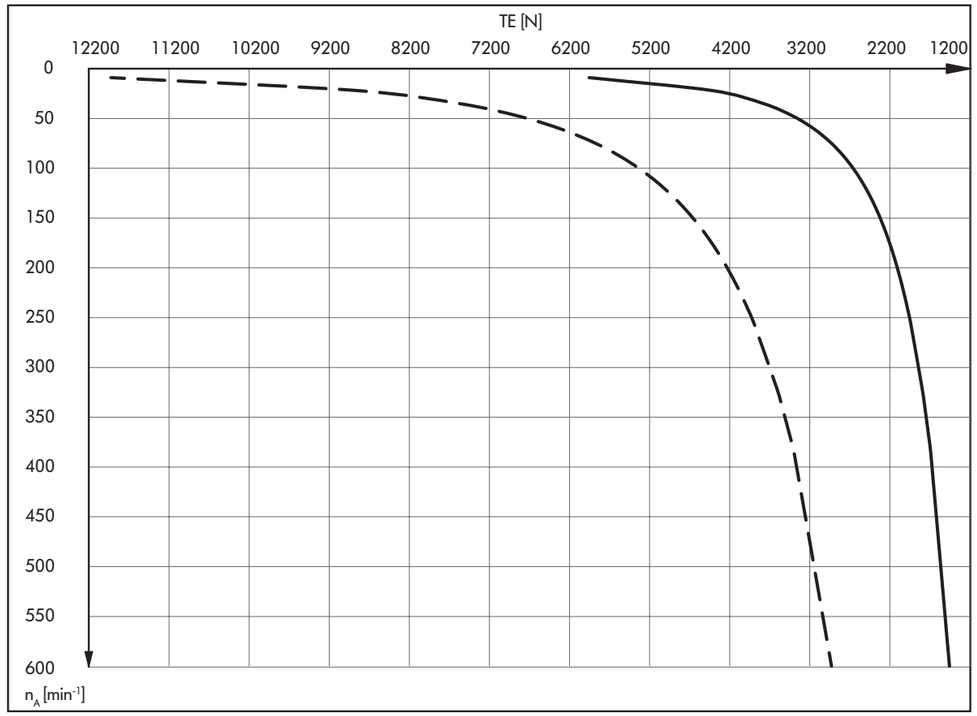
P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	Overload factor	SL_{min} mm
0.080	8	1	5	2.560	600.0	1.2	29	3	185
			8	1.600	375.0	1.9	47	3	185
		2	12	1.067	250.0	2.8	68	3	200
			16	0.800	187.5	3.7	90	3	200
			20	0.640	150.0	4.6	113	3	200
			25	0.512	120.0	5.8	141	3	200
			32	0.400	93.8	7.4	181	3	200
			40	0.320	75.0	9.2	226	3	200
		3	60	0.213	50.0	13.4	328	3	215
			80	0.160	37.5	17.8	437	3	215
			100	0.128	30.0	22.3	546	3	215
			120	0.107	25.0	24.3	596	3	215
			160	0.080	18.8	32.4	795	3	215
0.110	8	1	5	2.560	600.0	1.7	41	3	235
			8	1.600	375.0	2.7	65	3	235
		2	12	1.067	250.0	3.9	95	3	250
			16	0.800	187.5	5.2	126	3	250
			20	0.640	150.0	6.4	158	3	250
			25	0.512	120.0	8.1	198	3	250
			32	0.400	93.8	10.3	253	3	250
			40	0.320	75.0	12.9	316	3	250
		3	60	0.213	50.0	18.7	459	3	265
0.180	8	1	5	2.560	600.0	2.7	66	3	250
			8	1.600	375.0	4.3	106	3	250
		2	12	1.067	250.0	6.3	154	3	265
			16	0.800	187.5	8.4	206	3	265
			20	0.640	150.0	10.5	257	3	265
			25	0.512	120.0	13.1	322	3	265
			32	0.400	93.8	16.8	412	3	265
			40	0.320	75.0	21.0	515	3	265
0.450	8	1	8	2.400	562.5	7.3	178	3	250
		2	12	1.600	375.0	10.5	259	3	265
			16	1.200	281.3	14.1	345	3	265
			20	0.960	225.0	17.6	431	3	265
			25	0.768	180.0	22.0	539	3	265
			32	0.600	140.6	28.1	690	3	265
			40	0.480	112.5	35.1	862	2.7	265

P_N	Rated power
np	Number of poles
gs	Gear stages
i	Gear ratio
v	Rated velocity of the shell
n_A	Rated revolutions of the drum shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
SL_{min}	Min. shell length

INTERROLL DRUM MOTOR 80D

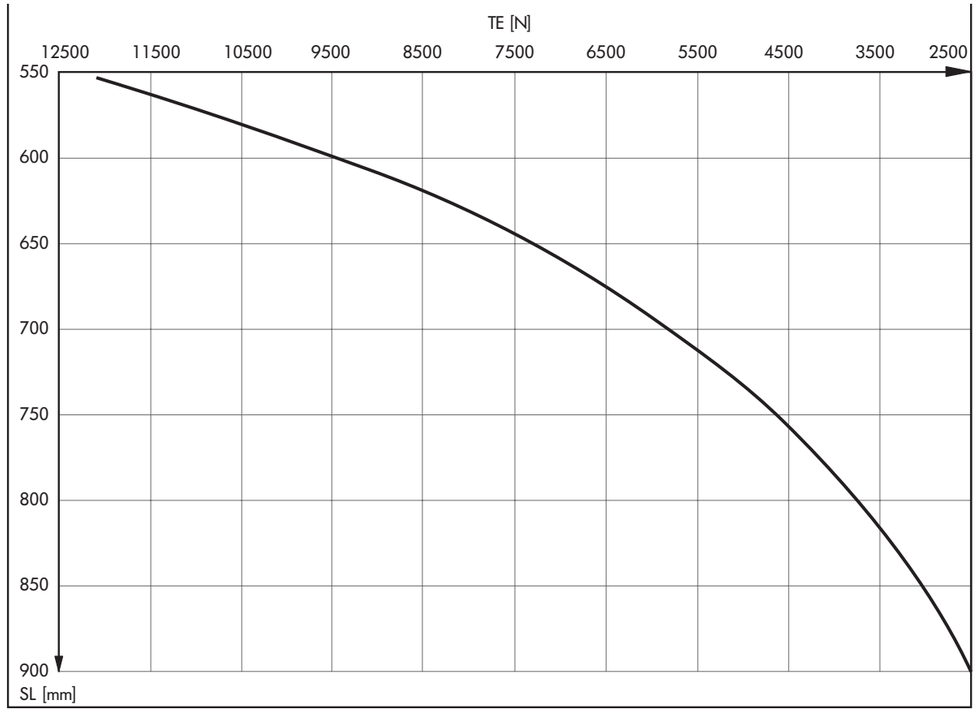
Compact and robust drive for smart belt conveyors with high dynamics

Belt Tension



Standard design

Reinforced axle, optional



TE	Belt Tension
n_A	Rated revolutions of the drum shell
SL	Shell length

Note: To get the right value of the maximum allowed belt tension, first find the maximum allowed TE value for the drum motor RPM. For motors with SL > 750 mm,check if the maximum allowed TE value for the SL is lower. In this case, use the lower value as maximum allowed TE value.

INTERROLL DRUM MOTOR 80D

Compact and robust drive for smart belt conveyors with high dynamics

Electrical data for for synchronous motor 80D

P_N kW	U_N V	np	U_L V DC	I_N A	M_N Nm	η	f_N Hz	n_N min^{-1}	T_e ms	K_E V/krpm	K_{TN} Nm/A	I_0 A	M_0 Nm	I_{MAX} A	M_{MAX} Nm	J_R $kgcm^2$	R_{M20} Ω	R_{M75} Ω	L_{sd} mH	L_{sq} mH
0.145	400	8	560	0.47	0.46	0.83	200	3000	4.41	72.23	0.98	0.47	0.46	1.41	1.38	0.1413	62.54	75.95	130.7	138.0
	230	8	325	0.81	0.46	0.85	200	3000	4.97	41.57	0.57	0.81	0.46	2.43	1.38	0.1413	21.62	26.26	45.60	53.70
0.298	400	8	560	0.78	0.95	0.87	200	3000	6.48	83.09	1.22	0.78	0,95	2.34	2.85	0.2826	29.06	35.29	81.90	94.10
	230	8	325	1.30	0.95	0.86	200	3000	5.75	47.46	0.73	1.30	0.95	3.90	2.85	0.2826	10.20	12.39	27.80	29.30
0.425	400	8	560	1.32	1.35	0.86	200	3000	6.70	80.80	1.02	1.32	1.35	3.96	4.05	0.4239	17.60	21.38	49.80	59.00
	230	8	325	2.30	1.35	0.87	200	3000	6.86	45.81	0.59	2.30	1.35	6.90	4.05	0.4239	5.66	6.87	16.26	19.42
0.700	400	8	560	2.52	1.49	0.87	300	4500	6.86	45.81	0.59	2.52	1.49	6.78	4.0	0.4239	5.66	6.87	16.26	19.42

Electrical data for for synchronous motor 80D oil-free

P_N kW	U_N V	np	U_L V DC	I_N A	M_N Nm	η %	f_N Hz	n_N min^{-1}	T_e ms	K_E V/krpm	K_{TN} Nm/A	I_0 A	M_0 Nm	I_{MAX} A	M_{MAX} Nm	J_R $kgcm^2$	R_{M20} Ω	R_{M75} Ω	L_{sd} mH	L_{sq} mH
0.080	400	8	560	0.26	0.25	0.83	200	3000	4.41	72.23	0.98	0.26	0.25	0.78	0.76	0.1413	62.54	75.95	130.70	138.0
	230	8	325	0.45	0.25	0.85	200	3000	4.97	41.57	0.57	0.45	0.25	1.34	0.76	0.1413	21.62	26.26	45.60	53.70
0.110	400	8	560	0.29	0.35	0.87	200	3000	6.48	83.09	1.22	0.29	0.35	0.86	1.05	0.2826	29.06	35.29	81.90	94.10
	230	8	325	0.48	0.35	0.86	200	3000	5.75	47.46	0.73	0.48	0.35	1.44	1.05	0.2826	10.20	12.39	27.80	29.30
0.180	400	8	560	0.56	0.57	0.86	200	3000	6.70	80.80	1.02	0.56	0.57	1.69	1.72	0.4239	17.60	21.38	49.80	59.0
	230	8	325	1.97	0.57	0.87	200	3000	6.86	45.81	0.59	0.97	0.57	2.91	1.72	0.4239	5.66	6.87	16.26	19.42
0.450	400	6	560	1.62	0.95	0.87	300	4500	6.86	45.81	0.59	1.62	0.95	4.86	2.86	0.4239	5.66	6.87	16.26	19.42

P_N	Rated power
np	Number of poles
U_N	Rated voltage
U_L	DC link voltage
I_N	Rated current
M_N	Rated torque of rotor
η	Efficiency
f_N	Rated frequency
n_N	Rated speed of rotor
T_e	Electrical time constant
k_e	BEMF (Back Electromotive Force) constant: effective phase to phase
k_{TN}	Torque constant
I_0	Standstill current
M_0	Standstill torque
I_{MAX}	Maximum current
M_{MAX}	Maximum torque
J_R	Rotor moment of inertia
R_{M20}	Phase to phase resistance at 20 °C
R_{M75}	Phase to phase resistance at 75 °C
L_{SD}	d-axis inductance
L_{SQ}	q-axis inductance

Cable Specifications

Available cables for connectors (see also p 234):

- Standard, screened
- Halogen-free, screened

Available length: 1 / 3 / 5 / 10 m

Connection Diagrams

For connection diagrams, see Planning Section on p 261.

INTERROLL DRUM MOTOR 80D

Compact and robust drive for smart belt conveyors with high dynamics

Standard dimensions

Dimensions

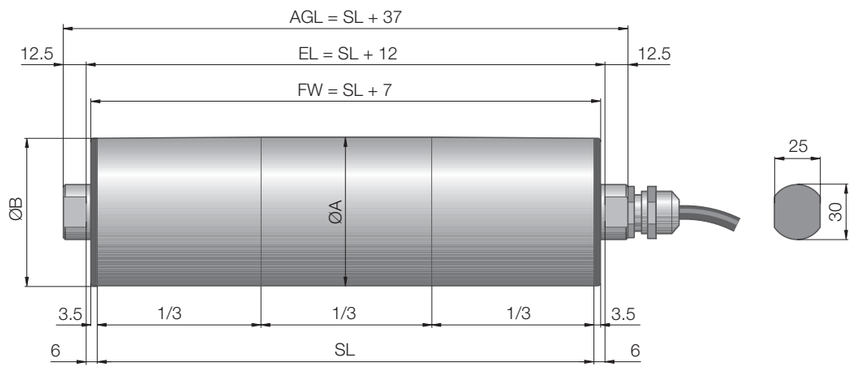


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
80D crowned shell	81.5	80.5
80D cylindrical shell	81.0	81.0
80D cylindrical shell + key	81.7	81.7

Connector dimensions

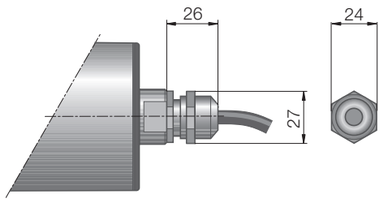


Fig.: Straight connector, brass/nickel or stainless steel

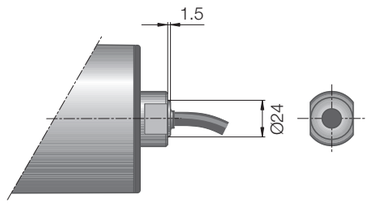


Fig.: Straight cable outlet, PU shaft plug

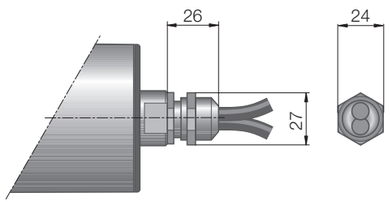


Fig.: Straight connector / Feedback device, brass/nickel or stainless steel

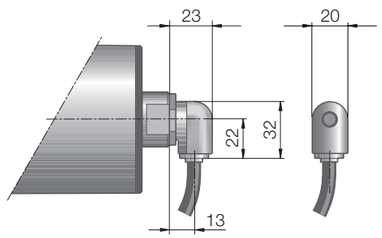


Fig.: Elbow connector, technopolymer

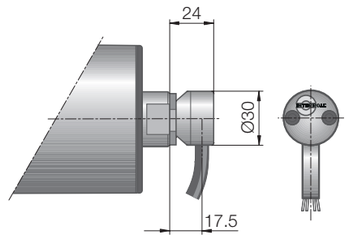


Fig.: Elbow connector, stainless steel

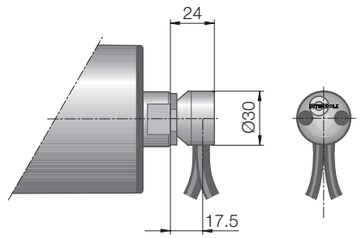


Fig.: Elbow connector / Feedback device, stainless steel

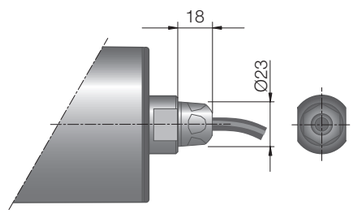


Fig: Straight hygienic connector, IP69k stainless steel

The following options increase the minimum length of the drum motor.

Min. length with option

Option	Min. SL with option mm
Feedback device	Min. SL + 75 (SL + 90 for Hiperface feedback option)
Reinforced axle	Min. SL + 90

Standard drum motor lengths and their weights:

Standard length and weight

Shell length SL in mm	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
Average weight in kg	6.6	7.0	7.4	7.9	8.7	9.1	9.6	10.0	10.5	10.9	11.4	11.8	12.3	12.7	13.2

INTERROLL DRUM MOTOR 113D

Compact and robust drive for smart belt conveyors with high dynamics

Product Description

Applications

The drum motor is perfect for high dynamic applications, food conveyors, smart belt and many servo conveyor belt applications.

- ✓ Small feed conveyors with high-duty cycles
- ✓ High performance packaging conveyors
- ✓ Dynamic weighing equipment
- ✓ Smart belts
- ✓ Pick and place applications
- ✓ Food processing (EHEDG)
- ✓ Dry, wet and wash-down applications

Characteristics

- ✓ Stainless steel end housings
- ✓ 3-phase AC synchronous permanent magnet motor
- ✓ High Torque
- ✓ Integral motor protection
- ✓ Steel-hardened planetary gear
- ✓ Wide variable speed range
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ High efficiency
- ✓ New! Oil-free variants now available

Note: Synchronous drum motors must be connected to a drive controller and not directly to the mains supply. For feedback or positioning applications use a servo-driver.

Technical Data

Electrical data	
Motor type	AC Synchronous permanent magnet motor
Insulation class of motor windings	Class F, IEC 34 (VDE 0530)
Voltage	Special voltage on request 230/400 V
Internal shaft sealing system	Double-lipped, FPM
Protection rate	IP69K
Thermal protection (see p 227)	Bi-metal switch
Operating modes (see p 214)	S1
Ambient temperature, 3-phase motor (see p 191)	+5 to +40 °C
General technical data	
Max. shell length SL	900 mm

Order Information

Please refer to the Configurator at the end of the catalogue..

Material Versions

You can choose the following versions of drum body components and electrical connection. The versions depend on the material of the components.

Component	Version	Material			
		Mild steel	Stainless steel	Brass / Nickel	Techno-polymer
Shell	Crowned	✓	✓		
	Cylindrical	✓	✓		
	Cylindrical + key, for using sprockets	✓	✓		
End housing	Standard		✓		
Shaft	Standard		✓		
External seal	PTFE				
Electrical connector	Straight connector		✓	✓	
	Straight cable outlet				✓
	Elbow connector		✓		✓
	Straight hygienic connector		✓		

Please contact your Interroll customer consultant for further versions.

Options

- Lagging for friction drive belts, see p 116
- Lagging for plastic modular belts, see p 122
- Lagging for positive drive solid homogeneous belts belts, see p 126
- Sprockets for plastic modular belts, see p 128
- Feedback devices, see p 142
- Food-grade oil (EU, FDA), see p 238
- Low temperature oil, see p 238
- cULus safety certifications, see p 233
- Non-horizontal mounting (more than ± 5°), see p 215
- Oil-free variants
- Reinforced axle see p 108

Accessories

- Plummer block bracket, see p 160
- Idler pulleys, see p 162 to p 165
- Conveyor rollers, see p 172

INTERROLL DRUM MOTOR 113D

Compact and robust drive for smart belt conveyors with high dynamics

Product Range

The following tables give an overview of the possible motor versions. When ordering, please specify the version in accordance with the configurator at the end of the catalogue.

All data and values in this catalogue refer to 200 Hz or 225 Hz operation.

Motor versions

Mechanical data for synchronous motor 113D

P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	Overload factor	SL_{min} mm
0.145	8	1	5	3.566	600.0	2.2	39	3	185
			8	2.229	375.0	3.5	62	3	185
		2	12	1.486	250.0	5.1	90	3	200
			16	1.114	187.5	6.8	120	3	200
			20	0.891	150.0	8.5	150	3	200
			25	0.713	120.0	10.6	187	3	200
			32	0.557	93.8	13.6	239	3	200
			40	0.446	75.0	17.0	299	3	200
		3	60	0.297	50.0	24.6	434	3	215
			80	0.223	37.5	32.9	579	2.9	215
			100	0.178	30.0	41.1	724	2.3	215
			120	0.149	25.0	44.9	791	2.1	215
			160	0.111	18.8	59.8	1054	1.6	215
0.298	8	1	5	3.566	600.0	4.5	79	3	235
			8	2.229	375.0	7.2	127	3	235
		2	12	1.486	250.0	10.5	185	3	250
			16	1.114	187.5	14.0	246	3	250
			20	0.891	150.0	17.5	308	3	250
			25	0.713	120.0	21.8	384	3	250
			32	0.557	93.8	27.9	492	3	250
			40	0.446	75.0	34.9	615	2.8	250
		3	60	0.297	50.0	50.7	893	1.9	265
0.425	8	1	5	3.566	600.0	6.4	113	3	250
			8	2.229	375.0	10.3	181	2,8	250
		2	12	1.486	250.0	14.9	263	3	265
			16	1.114	187.5	19.9	351	3	265
			20	0.891	150.0	24.9	439	3	265
			25	0.713	120.0	31.1	548	3	265
			32	0.557	93.8	39.8	702	2.4	265
			40	0.446	75.0	49.8	877	1.9	265
1.100	6	1	8	3.343	562.5	17,7	312	1.6	250
		2	12	2.229	375.0	25.7	453	1.7	265
			16	1.671	281.3	34.3	604	1.7	265
			20	1.337	225.0	42.9	755	1.7	265
			25	1.070	180.0	53.6	944	1.7	265

Mechanical data for synchronous motor 113D oil-free

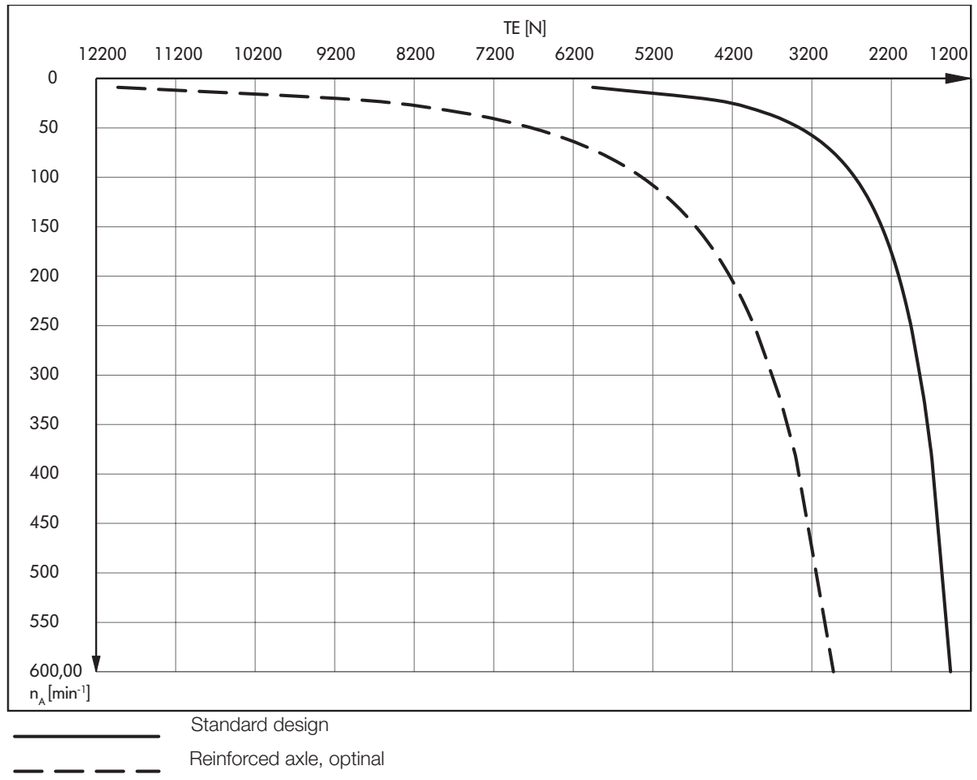
P_N kW	np	gs	i	v m/s	n_A min^{-1}	M_A Nm	F_N N	Overload factor	SL_{min} mm
0.080	8	1	5	3.566	60.0	1.2	21	3	185
			8	2.229	375.0	1.9	33	3	185
		2	12	1.486	250.0	2.8	49	3	200
			16	1.114	187.5	3.7	65	3	200
			20	0.891	150.0	4.6	81	3	200
			25	0.713	120.0	5.8	101	3	200
			32	0.557	93.8	7.4	130	3	200
			40	0.446	75.0	9.2	162	3	200
		3	60	0.297	50.0	13.4	235	3	215
			80	0.223	37.5	17.8	314	3	215
			100	0.178	30.0	22.3	392	3	215
			120	0.149	25.0	24.3	428	3	215
			160	0.111	18.8	32.4	571	3	215
0.110	8	1	5	3.566	600.0	1.7	29	3	235
			8	2.229	375.0	2.7	47	3	235
		2	12	1.486	250.0	3.9	68	3	250
			16	1.114	187.5	5.2	91	3	250
			20	0.891	150.0	6.4	113	3	250
			25	0.713	120.0	8.1	142	3	250
			32	0.557	93.8	10.3	182	3	250
			40	0.446	75.0	12.9	227	3	250
		3	60	0.297	50.0	18.7	329	3	265
0.180	8	1	5	3.566	600.0	2.7	48	3	250
			8	2.229	375.0	4.3	76	3	250
		2	12	1.486	250.0	6.3	111	3	265
			16	1.114	187.5	8.4	148	3	265
			20	0.891	150.0	10.5	185	3	265
			25	0.713	120.0	13.1	231	3	265
			32	0.557	93.8	16.8	296	3	265
			40	0.446	75.0	21.0	370	3	265
0.670	6	1	8	3.343	562.5	10.8	190	2.7	250
		2	12	2.229	375.0	15.7	276	2.8	265
			16	1.671	281.3	20.9	368	2.8	265
			20	1.337	225.0	26.1	460	2.8	265
			25	1.070	180.0	32.7	576	2.8	265

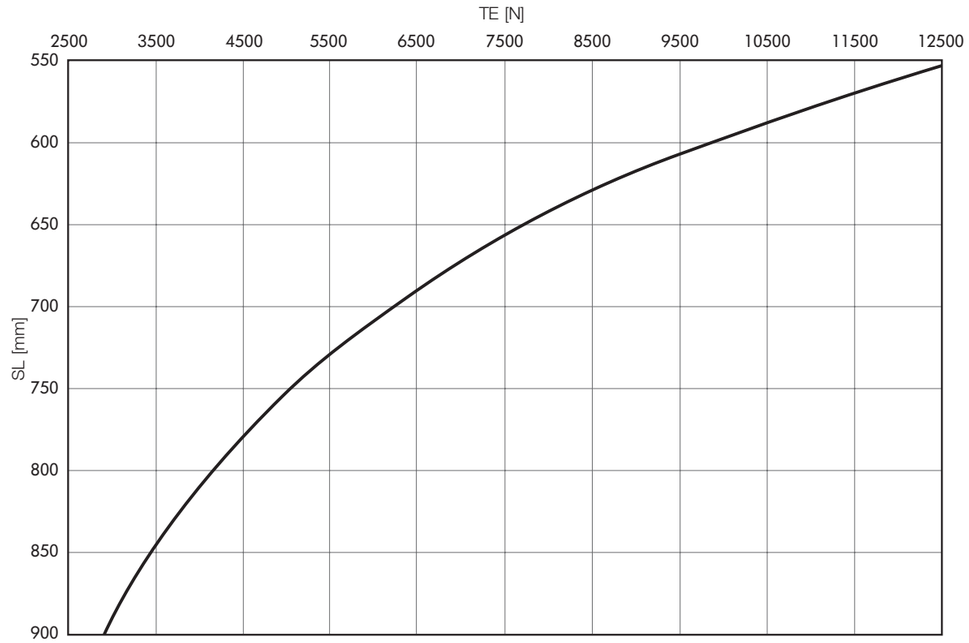
P_N	Rated power
np	Number of poles
gs	Gear stages
i	Gear ratio
v	Rated velocity of the shell
n_A	Rated revolutions of the drum shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
SL_{min}	Min. shell length

INTERROLL DRUM MOTOR 113D

Compact and robust drive for smart belt conveyors with high dynamics

Belt Tension





TE	Belt Tension
n_A	Rated revolutions of the drum shell
SL	Shell length

Note: To get the right value of the maximum allowed belt tension, find the maximum allowed TE value for the drum motor RPM. The TE value for SL does not need to be considered for standard 113D.

INTERROLL DRUM MOTOR 113D

Compact and robust drive for smart belt conveyors with high dynamics

Electrical data for synchronous motor 113D

P_N kW	U_N V	np	U_L V DC	I_N A	M_N Nm	η	f_N Hz	n_N min^{-1}	T_e ms	K_E V/krpm	K_{TN} Nm/A	I_0 A	M_0 Nm	I_{MAX} A	M_{MAX} Nm	J_R kgcm²	R_{M20} Ω	R_{M75} Ω	L_{sd} mH	L_{sq} mH
0.145	400	8	560	0.47	0.46	0.83	200	3000	4.41	72.23	0.98	0.47	0.46	1.41	1.38	0.1413	62.54	75.95	130.7	138.0
	230	8	325	0.81	0.46	0.85	200	3000	4.97	41.57	0.57	0.81	0.46	2.43	1.38	0.1413	21.62	26.26	45.60	53.70
0.298	400	8	560	0.78	0.95	0.87	200	3000	6.48	83.09	1.22	0.78	0.95	2.34	2.85	0.2826	29.06	35.29	81.90	94.10
	230	8	325	1.30	0.95	0.86	200	3000	5.75	47.46	0.73	1.30	0.95	3.90	2.85	0.2826	10.20	12.39	27.80	29.30
0.425	400	8	560	1.32	1.35	0.86	200	3000	6.70	80.80	1.02	1.32	1.35	3.96	4.05	0.4239	17.60	21.38	49.80	59.00
	230	8	325	2.30	1.35	0.87	200	3000	6.86	45.81	0.59	2.30	1.35	6.90	4.05	0.4239	5.66	6.87	16.26	19.42
1.100	400	6	560	2.31	2.33	0.87	225	4500	6.39	65.7	1.01	2.31	2.33	3.97	4.00	0.7200	4.85	5.90	13.20	15.50

Electrical data for synchronous motor 113D oil-free

P_N kW	U_N V	np	U_L V DC	I_N A	M_N Nm	η	f_N Hz	n_N min^{-1}	T_e ms	K_E V/krpm	K_{TN} Nm/A	I_0 A	M_0 Nm	I_{MAX} A	M_{MAX} Nm	J_R kgcm²	R_{M20} Ω	R_{M75} Ω	L_{sd} mH	L_{sq} mH
0.080	400	8	560	0.26	0.25	0.83	200	3000	4.41	72.23	0.98	0.26	0.25	0.78	0.76	0.1413	62.54	75.95	130.70	138.0
	230	8	325	0.45	0.25	0.85	200	3000	4.97	41.57	0.57	0.45	0.25	1.34	0.76	0.1413	21.62	26.26	45.60	53.70
0.110	400	8	560	0.29	0.35	0.87	200	3000	6.48	83.09	1.22	0.29	0.35	0.86	1.05	0.2826	29.06	35.29	81.90	94.10
	230	8	325	0.48	0.35	0.86	200	3000	5.75	47.46	0.73	0.48	0.35	1.44	1.05	0.2826	10.20	12.39	27.80	29.30
0.180	400	8	560	0.56	0.57	0.86	200	3000	6.70	80.80	1.02	0.56	0.57	1.69	1.72	0.4239	17.60	21.38	49.80	59.0
	230	8	325	1.97	0.57	0.87	200	3000	6.86	45.81	0.59	0.97	0.57	2.91	1.72	0.4239	5.66	6.87	16.26	19.42
0.670	400	6	560	1.48	1.42	0.88	225	4500	6.39	65.7	0.96	1.48	1.42	4.17	4.0	0.7200	4.85	5.90	13.20	15.50

P_N	Rated power
np	Number of poles
U_N	Rated voltage
U_L	DC link voltage
I_N	Rated current
M_N	Rated torque of rotor
η	Efficiency
f_N	Rated frequency
n_N	Rated speed of rotor
T_e	Electrical time constant
k_e	BEMF (Back Electromotive Force) constant: effective phase to phase
k_{TN}	Torque constant
I_0	Standstill current
M_0	Standstill torque
I_{MAX}	Maximum current
M_{MAX}	Maximum torque
J_R	Rotor moment of inertia
R_{M20}	Phase to phase resistance at 20 °C
R_{M75}	Phase to phase resistance at 75 °C
L_{SD}	d-axis inductance
L_{SQ}	q-axis inductance

Cable Specifications

Available cables for connectors (see also p 234):

- Standard, screened
- Halogen-free, screened

Available length: 1 / 3 / 5 / 10 m

Connection Diagrams

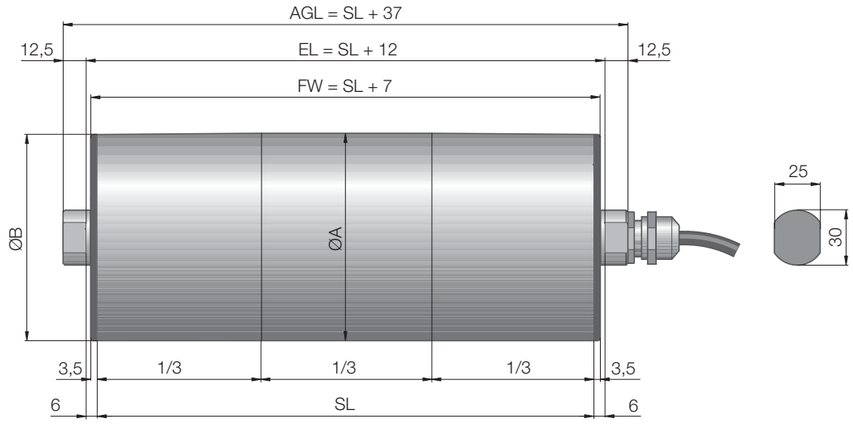
For connection diagrams, see Planning Section on p 261.

INTERROLL DRUM MOTOR 113D

Compact and robust drive for smart belt conveyors with high dynamics

Standard dimensions

Dimensions



Type	Ø A mm	Ø B mm
113D crowned shell	113.5	112.0
113D cylindrical shell	112.0	112.0
113D cylindrical shell + key	113.0	113.0

Connector dimensions

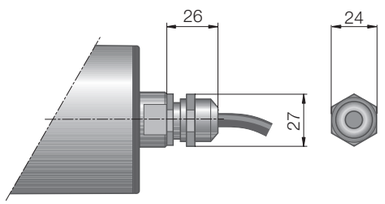


Fig.: Straight connector, brass/nickel or stainless steel

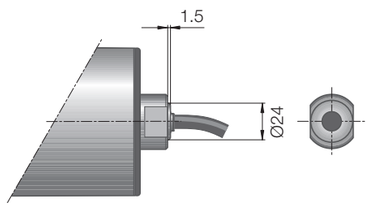


Fig.: Straight cable outlet, PU shaft plug

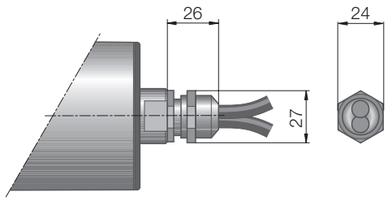


Fig.: Straight connector / Feedback device, brass/nickel or stainless steel

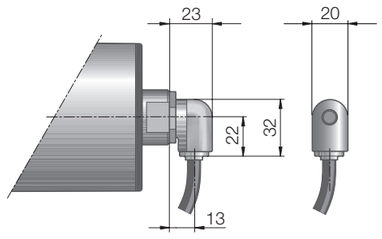


Fig.: Elbow connector, technopolymer

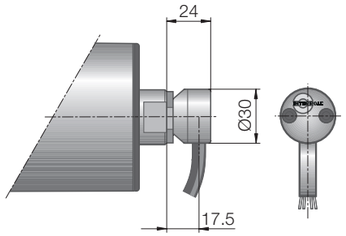


Fig.: Elbow connector, stainless steel

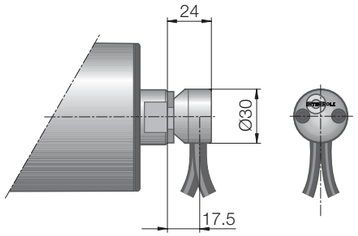


Fig.: Elbow connector / Feedback device, stainless steel

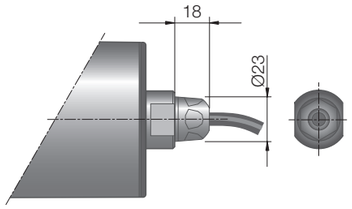


Fig: Straight hygienic connector, IP69k stainless steel

The following options increase the minimum length of the drum motor.

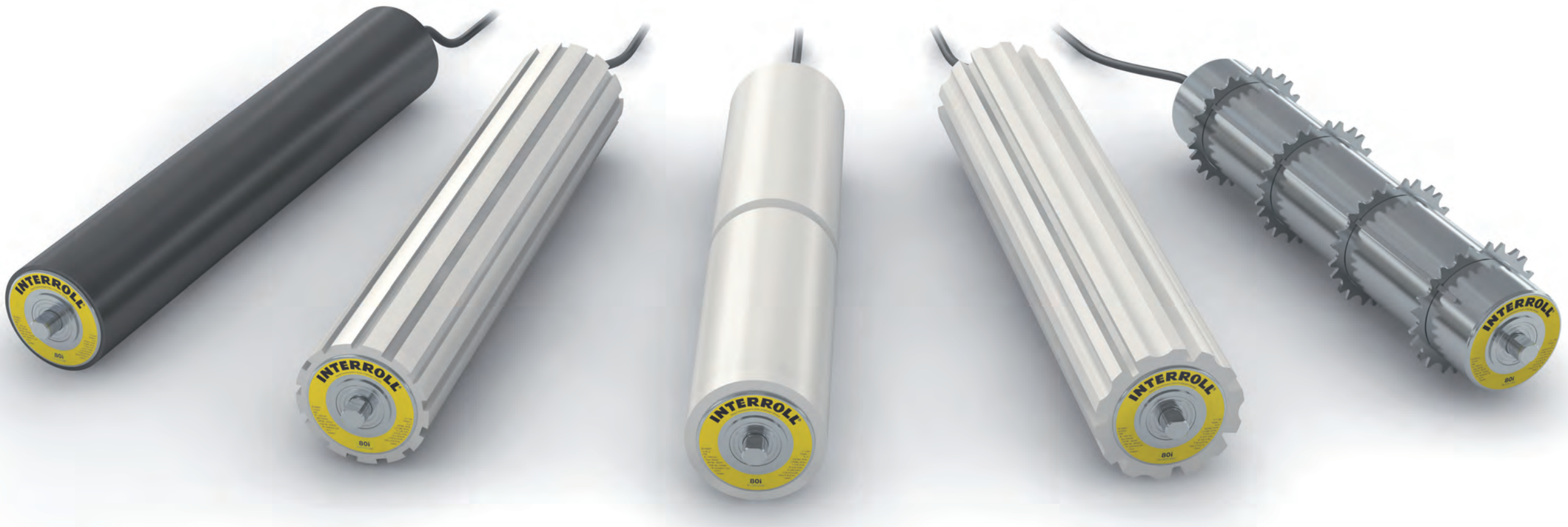
Min. length with option

Option	Min. SL with option mm
Feedback device	Min. SL + 75 (SL + 90 for Hiperface feedback option)
Reinforced axle	Min. SL + 90

Standard drum motor lengths and their weights:

Standard length and weight

Shell length SL in mm	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
Average weight in kg	9.8	10.6	11.3	12.0	12.8	13.5	14.3	15.0	15.7	16.4	17.1	17.9	18.6	19.3	20.0



OPTIONS

- ✓ **Interroll's focus is optimum customisation for your application when developing options for Interroll Drum Motors.**
- ✓ **This chapter includes options which are integral to the Interroll Drum Motor when it is delivered.**

➲ Lagging for Friction Drive Belts p 116

➲ Lagging for Positive Drive Belts

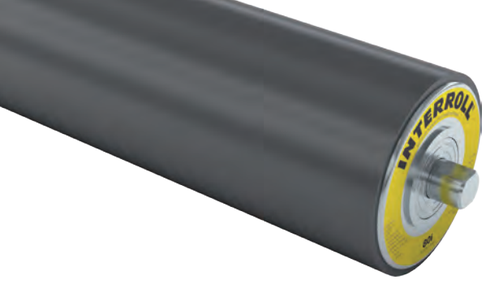
Lagging for plastic modular belts p 122
Lagging for positive drive solid homogeneous belts p 126

➲ Sprockets for Plastic Modular Belts p 128

➲ Control Options for Drum Motors

Backstops p 134
Dynamic balancing p 135
Electromagnetic brakes p 136
Rectifiers p 138
Feedback Devices p 142

Refer to the Planning Section from p 178 for help with planning and design



LAGGING FOR FRICTION DRIVE BELTS

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

Product Description

Applications

- ✓ Wet applications
- ✓ For standard drum motors
- ✓ Food and hygienic applications
- ✓ Flat belt, multi V-belt or round belt applications

Characteristics

- ✓ High resistance to oil, fuel and other chemicals
- ✓ Lagging increases friction between drum motor shell and conveyor belt
- ✓ Lagging prevents slip between drum motor shell and conveyor belt
- ✓ Longitudinal grooved lagging reduces liquids between belt and shell
- ✓ Centered V-groove for belt tracking facility
- ✓ Multiple V-grooves for V-belt or round belt conveyors
- ✓ Hot vulcanisation for high-torque drum motors
- ✓ Hot vulcanisation is more hygienic

Note: Lagging has an influence on the outer diameter of the drum motor and on the velocity. Belt pull and speed of the drum motor must be recalculated according to the increased diameter.

Technical Data

Material	Hot or cold vulcanised NBR Other materials on request
Ambient temperature	-40 to +120 °C
Shore hardness	65 to 70 ± 5 Shore A

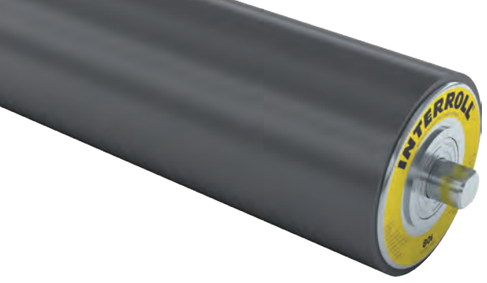
Product Range

Cold vulcanisation

Lagging profile	Colour	Characteristics	Shore hardness	Thickness mm
Smooth	Black	Oil- and fat-resistant	65 ± 5 Shore A	3, 4
	White	FDA food approved	70 ± 5 Shore A	
Longitudinal grooves	White	FDA food approved	70 ± 5 Shore A	8
Diamond patterned	Black	Oil- and fat-resistant	70 ± 5 Shore A	8

Hot vulcanisation

Lagging profile	Colour	Characteristics	Shore hardness	Thickness mm
Smooth	Black	Oil- and fat-resistant	65 ± 5 Shore A	2, 3, 4, 5, 6, 8, 10, 12, 14, 16
	White/Blue	FDA food approved EC1935/2004 approved	70 ± 5 Shore A	
Longitudinal grooves	Black	Oil- and fat-resistant	65 ± 5 Shore A	6, 8, 10, 12, 14, 16
	White/Blue	FDA food approved EC1935/2004 approved	70 ± 5 Shore A	
Diamond patterned	Black	Oil- and fat-resistant	65 ± 5 Shore A	6, 8, 10, 12, 14, 16
	White/Blue	FDA food approved EC1935/2004 approved	70 ± 5 Shore A	
V-groove	Black	Oil- and fat-resistant	65 ± 5 Shore A	6, 8, 10, 12, 14, 16
	White/Blue	FDA food approved EC1935/2004 approved	70 ± 5 Shore A	



LAGGING FOR FRICTION DRIVE BELTS

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

Dimensions

Smooth **Cold and hot vulcanisation**

Please refer to the following table for standard crowning of rubber lagging.

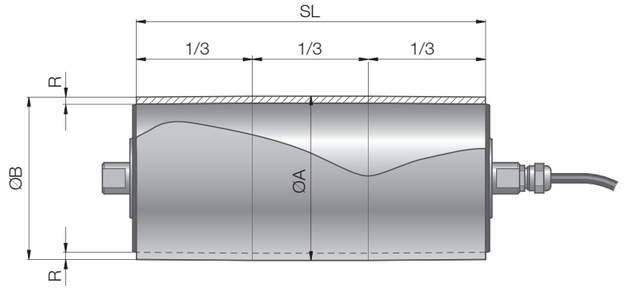


Fig.: Smooth lagging

Drum motor	Shell Ø mm	Cold vulcanisation			Hot vulcanisation		
		Min./max. R mm	Ø A mm	Ø B mm	Min./max. R mm	Ø A mm	Ø B mm
80S	81.5	3	87.5	86.0	2	85.5	84.0
		4	89.5	88.0	6	93.5	92.0
80i	81.5	3	87.5	86.5	2	85.5	84.5
		4	89.5	88.5	16	113.5	112.5
80D	81.5				2	85.5	84.5
					16	113.5	112.5
113S	113.3	3	119.3	117.8	2	117.3	115.8
		4	121.3	119.8	6	125.3	123.8
113i	113.5	3	119.5	118.0	2	117.5	116.0
		4	121.5	120.0	16	145.5	144.0
113D	113.5				2	117.5	116.0
					16	145.5	144.0
138i	138.0	3	144.0	142.0	2	142.0	140.0
		4	146.0	144.0	16	170.0	168.0
165i	164.0	3	170.0	168.0	2	168.0	166.0
		4	172.0	170.0	16	196.0	194.0
217i	217.5	3	223.5	221.5	2	221.5	219.5
		4	225.5	223.5	16	249.5	247.5

Longitudinal

Cold and hot vulcanisation

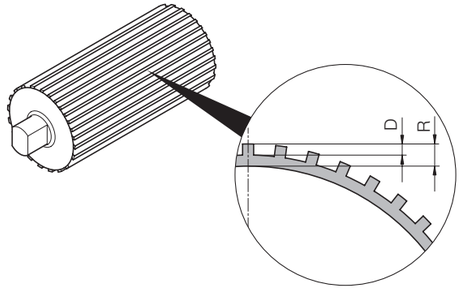


Fig.: Longitudinal grooved lagging

D mm	R, cold vulcanisation mm	R, hot vulcanisation mm
4	8	6, 8, 10, 12, 14, 16

Note: Only possible for i- and D-Types

Diamond patterned

Cold and hot vulcanisation

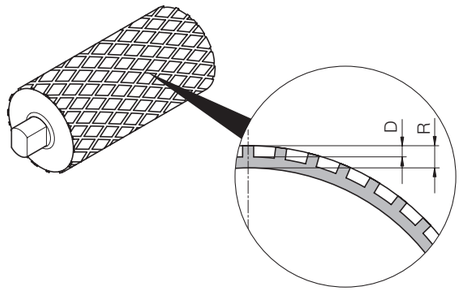
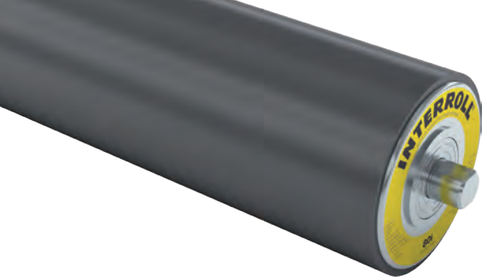


Fig.: Diamond patterned lagging

D mm	R , cold vulcanisation mm	R, hot vulcanisation mm
4	8	6, 8, 10, 12, 14, 16

Note: Only possible for i- and D-Types



LAGGING FOR FRICTION DRIVE BELTS

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

V-grooved **Hot vulcanisation**

A centered V-groove in the lagging enables the use of conveyor belts fitted with a tracking profile on the underside of the belt which helps to prevent belt wander. The drum lagging groove should not be used to guide the belt. The actual tracking and guiding of the belt should be made using a conveyor slide bed or roller bed with built in tracking grooves.

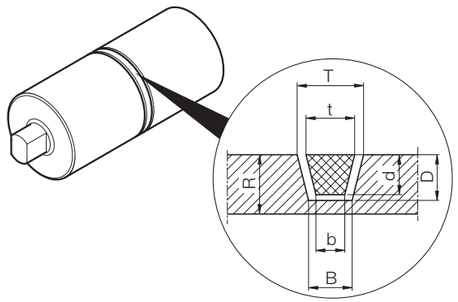


Fig.: V-grooved lagging

Groove	R Standard mm	R Option mm	Groove			Belt		
			T mm	B mm	D mm	t mm	b mm	d mm
K6	8	6	10	8	5	6	4	4
K8	8	6	12	8	6	8	5	5
K10	10	8	14	10	7	10	6	6
K13	12	10	17	11	9	13	7.5	8
K15	12	10	19	13	9	15	9.5	8
K17	14	12	21	13	12	17	9.5	11

LAGGING FOR PLASTIC MODULAR BELTS

Lagging based on the specification of plastic modular belt manufacturers

Product Description

Applications

- ✓ Food and hygienic applications
- ✓ For driving most common plastic modular belts
- ✓ For Motors for applications with positive drive belts or no belts
- ✓ For standard asynchronous drum motors with frequency inverter. The frequency inverter should be set up to reduce the power by 18 %.
- ✓ For synchronous drum motors (see p 92)

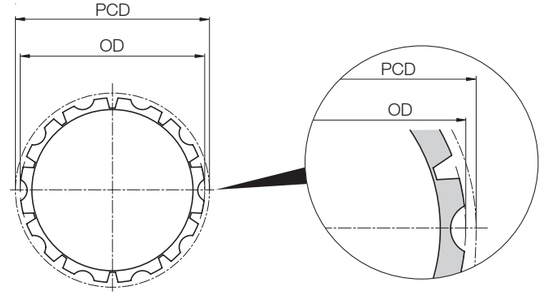
Note: Where possible, avoid using 8 and 12 pole motors with rubber lagging as they can reach high operating temperatures and may cause thermal overload. For further advice please contact your Interroll customer consultant.

Characteristics

- ✓ Resistant to abrasion
- ✓ Quiet operation
- ✓ Reduced wear on belt
- ✓ Easy to clean
- ✓ High resistance to oil, fat and chemicals

Note: Lagging has an influence on the outer diameter of the drum motor and on the velocity. The belt pull and speed of the drum motor must be recalculated according to the increased diameter. Refer to the velocity factor (VF) in the table below.

Product Range



Z	Number of teeth
OD	Outer diameter in mm
PCD	Pitch circle diameter in mm
VF	Velocity factor

Technical Data

Material	Hot vulcanised NBR
Temperature range	-40 to +120 °C
Shore hardness	70 ± 5 Shore A
Colours	White / Blue
Approvals	FDA / EC 1935/2004

Plastic modular belt manufacturer	Series	Lagging																					
		80i / 80D				113i / 113D				138i				165i				217I					
		Z	OD mm	PCD mm	VF	Z	OD mm	PCD mm	VF	Z	OD mm	PCD mm	VF	Z	OD mm	PCD mm	VF	Z	OD mm	PCD mm	VF		
Ammeraal Beltech / Uni-Chains																							
	HDS60500	24	98.5	97.3	1.21	32	131.0	129.6	1.14	38	155.2	153.8	1.11										
	HDS61000	12	99.0	98.1	1.22	16	132.0	130.2	1.15	19	156.6	154.3	1.12										
	HDS62000	7	110.8	114.1	1.42	9	144.2	146.2	1.29	10	160.5	161.8	1.17	12	193.0	193.3	1.18						
	CNB	12	98.0	98.5	1.22	16	131.0	130.7	1.15	19	155.5	154.9	1.12										
	MPB	7	105.5	117.1	1.45	9	140.0	148.5	1.31	10	156.6	164.4	1.19	12	190.0	196.3	1.20	15	239.0	244.3	1.12		
	OPB-4					9	144.0	146.2	1.29	10	160.0	161.8	1.17										
	OPB-8					9	139.5	146.2	1.29	10	155.5	161.8	1.17										
	S-MPB	12	97.9	100.1	1.24	16	132.0	132.3	1.17	20	165.0	164.9	1.19	24	198.0	199.0	1.21						
	UNI QNB					16	131.2	130.7	1.15														
	X-MPB					8	152.0	165.9	1.46														
Eurobelt																							
	B50									10	154.0	161.8	1.17	12	187.0	193.2	1.18						

LAGGING FOR PLASTIC MODULAR BELTS

Lagging based on the specification of plastic modular belt manufacturers

Plastic modular belt manufacturer	Series	Lagging 80i / 80D Z	OD mm	PCD mm	VF	113i / 113D Z	OD mm	PCD mm	VF	138i Z	OD mm	PCD mm	VF	165i Z	OD mm	PCD mm	VF	217I Z	OD mm	PCD mm	VF
Habasit																					
	M1200 PE/AC	24	92.5	97.3	1.21	32	125.0	129.6	1.14	38	149.5	153.8	1.11								
	M1200 PP	24	96.0	101.0	1.25	32	128.0	132.6	1.17	38	154.0	158.6	1.15								
	M2500	12	99.4	99.0	1.23	16	132.8	131.6	1.16	20	165.0	163.5	1.18	23	190.5	189.7	1.16				
	M5000					9	140.0	149.0	1.31	10	156.6	164.4	1.19	12	190.5	197.2	1.20				
Intralox																					
	800	7	105.5	116.5	1.45	9	140.1	148.5	1.31	10	156.8	164.4	1.19	12	190.0	196.3	1.20	15	239.0	244.3	1.12
	850					9	143.6	148.5	1.31					12	187.0	196.3	1.20				
	1600	13	105.8	105.8	1.31	16	130.5	130.2	1.15	20	163.0	162.4	1.18	23	187.4	186.5	1.14	30	244.3	243.0	1.12
	1650	13	104.9	105.8	1.31	16	129.3	130.2	1.15	20	162.0	162.4	1.18	23	186.3	186.4	1.14				
	1800					8	152.0	165.9	1.46	9	174.0	185.7	1.35								
	1100 FG PE/AC	20	91.0	98.9	1.23	26	120.6	128.4	1.13	32	150.0	157.8	1.14								
	1100 FG PP	20	91.5	99.5	1.24	26	121.4	129.1	1.14	32	151.0	158.8	1.15								
	1100 FT PE/AC	20	93.5	97.3	1.21	27	128.0	131.0	1.15	32	152.6	156.00	1.13								
	1100 FT PP	20	94.0	98.3	1.22	26	124.0	127.6	1.12	32	153.0	156.9	1.14	38	184.0	186.2	1.14				
Rexnord																					
	1010	12	97.5	98.1	1.22	16	130.0	130.2	1.15												
	2010					9	138.8	147.9	1.30	10	156.8	165.0	1.20								
Scanbelt																					
	S.25-100 & 600	12	92.2	98.7	1.23	16	123.0	128.2	1.13	19	146.5	151.9	1.10								
	S.25-800	12	93.6	96.8	1.20	16	125.8	128.3	1.13	20	157.8	159.8	1.16								
	S.50-100 & 600					9	131.2	146.8	1.29	11	164.5	178.2	1.29	12	179.0	193.0	1.18	16	244.0	256.3	1.18
	S.50-800					9	136.0	146.2	1.29	10	155.2	163.9	1.19	12	185.0	193.2	1.18	15	233.5	240.5	1.11
	S.50-801					9	138.0	139.0	1.22	10	155.0	164.0	1.19	12	185.0	195.6	1.19				
Forbo-Siegling																					
	LM14 Series 4	21	93.0	95.3	1.18																
	LM25 Series 2	13	107.0	107.0	1.33	16	131.5	131.5	1.16												
	LM50 Series 3					9	140.0	146.2	1.29	10	157.0	161.8	1.17	12	189.0	193.2	1.18	16	251.5	256.3	1.18
	LM50 Series 6	7	107.5	116.2	1.44	9	137.5	146.2	1.29	11	170.6	180.0	1.30	13	205.0	208.9	1.27				

Note on order information, see p 132.

If you didn't find your belt type or belt supplier please see updated list on www.interroll.com

LAGGING FOR POSITIVE DRIVE SOLID HOMOGENEOUS BELTS

Lagging based on the specification of positive drive solid homogeneous belt manufacturers

Product Description

Applications

- ✓ Food and hygienic applications
- ✓ For driving most common positive drive solid homogeneous belts
- ✓ For Motors for applications with positive drive belts
- ✓ For standard asynchronous drum motors with frequency inverter (see p 236). The frequency inverter should be set up to reduce the power by 18 %.
- ✓ For synchronous drum motors (see p 92)

Note: Where possible, avoid using 8 and 12 pole motors with lagging as they can reach high operating temperatures and may cause thermal overload. For further advice please contact your Interroll customer consultant.

Characteristics

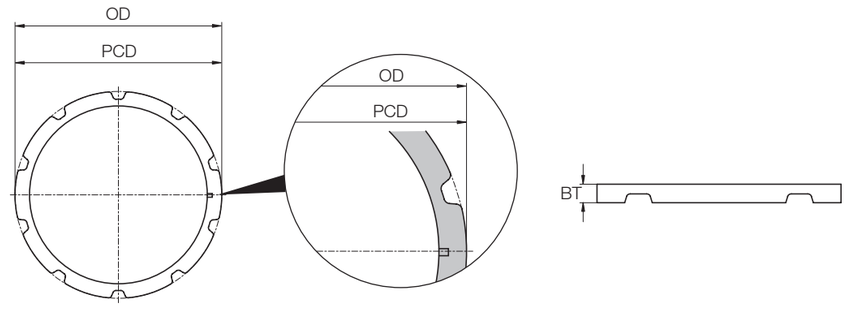
- ✓ High resistance to oil, fuel and other chemicals
- ✓ Resistant to abrasion
- ✓ Quiet operation
- ✓ Reduced wear on belt
- ✓ Easy to clean
- ✓ Low friction

Note: Lagging has an influence on the outer diameter of the drum motor and on the velocity. The belt pull and speed of the drum motor must be recalculated based on the increased diameter. Refer to the velocity factor (VF) in the table below.

Technical Data

Material	Interroll Premium Hygienic PU
Temperature range	- 40 to + 80 °C
Shore hardness	82 ± 5 D

Product Range

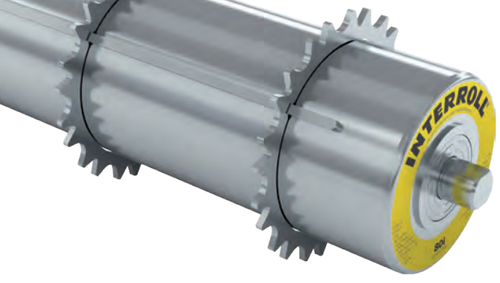


Z	Number of teeth
OD	Outer diameter in mm
PCD	Pitch circle diameter in mm
VF	Velocity factor
BT	Belt thickness

Belt Manufacturer	Series	Lagging															
		80i / 80D				113i / 113D				138i				165i			
		Z	OD mm	PCD mm	VF	Z	OD mm	PCD mm	VF	Z	OD mm	PCD mm	VF	Z	OD mm	PCD mm	VF
Intralox	TD 8026 PU (endless)	13	104,2	OD + BT	1,32	18	144,3	OD + BT	1,32	20	161,5	OD + BT					
	TD 8050 PU (endless)					9	142	145	1,28	10	158	161	1,17	12	190,2	193,2	1,18
	TD 8050 PU/XT (endless)													12	190,2	193,2	1,18
Volta	SD FHB-3/FHW-3 /(endless)	9	113,4	OD + BT	1,43	11	140	143	1,26					15	192,1	OD + BT	1,18
	DD 3 mm MW/MB (endless)					9	145,5	148,5	1,31	10	162	165	1,2				
Habasit	CD.M50 (endless)					9	142	145	1,28	10	158	161	1,17	12	190,2	193,2	1,18
	CD.M50 - Lace					9	142	145	1,28	10	158	161	1,17	12	190,2	193,2	1,18
Ammeraal	SoliFlexPro2 2 mm (endless PU-lightblue)					9	143,5	145,5	1,28	10	159,8	161,8	1,17				
	SoliFlexPro2 3 mm (endless PU-lightblue)					9	143,5	146,5	1,29	10	159,8	162,8	1,18	12	192,4	195,4	1,19
	SoliFlexPro2 4 mm (endless PU-lightblue)													12	192,4	196,4	1,2

Note on order information, see p 132.

If you didn't find your belt type or belt supplier please see updated list on www.interroll.com



SPROCKETS FOR PLASTIC MODULAR BELTS

Special sprockets based on the specification of modular belt manufacturers

Product Description

Applications

- ✓ For driving most common plastic modular belts
- ✓ For standard asynchronous drum motors with frequency inverter (see p 236). The frequency inverter should be set up to reduce the power by 18 %.
- ✓ For Motors for applications with positive drive belts or no belts
- ✓ For drum motors with cylindrical shell and key
- ✓ For food processing applications
- ✓ For synchronous drum motors (see p 92)

Characteristics

- ✓ Laser cut for excellent fitting accuracy
- ✓ Rust-free with stainless steel sprockets

Note: The sprockets have an influence on the outer diameter of the drum motor and on the velocity. The belt pull and speed of the drum motor must be recalculated according to the increased diameter. Refer to the velocity factor (VF) in the table below.

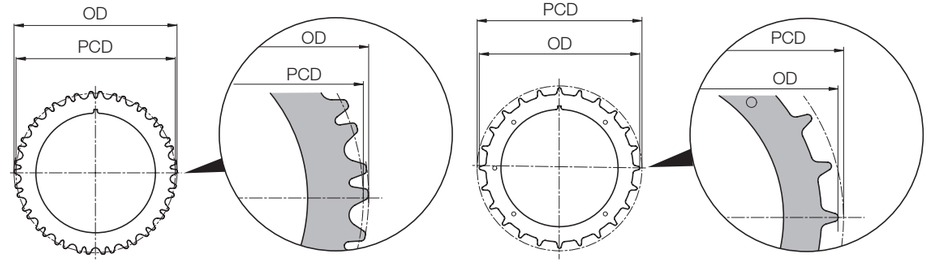
Fixed sprockets are available on request. Only one fixed sprocket per drum motor should be fitted to allow for belt expansion.

Technical Data

Material	Stainless steel, Mild steel
Temperature range	-30 to + 120 °C

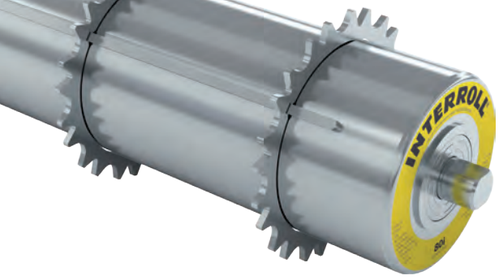
Product Range

To use sprockets, drum motors have to be ordered with cylindrical shell and with key.



Z	Number of teeth
OD	Outer diameter in mm
PCD	Pitch circle diameter in mm
VF	Velocity factor
B	Width of sprocket in mm
Rev.	Reversible sprocket
Art. No.	Article number

Modular belt manufacturer	Series	Rev.	Sprocket 80i / 80D Z	OD mm	PCD mm	VF	B mm	Art. No.	113i / 113D Z	OD mm	PCD mm	VF	B mm	Art. No.	138i Z	OD mm	PCD mm	VF	B mm	Art. No.	165i Z	OD mm	PCD mm	VF	B mm	Art. No.
Habasit																										
	M11XX	✓	26	111.9	107.1	1.33	8	1004345	32	136.3	131.6	1.16	6	1100024												
	M12XX	✓	25	103.7	101.0	1.25	3	1001631	36	150.2	149.8	1.32	3	1001638	40	166.9	162.0	1.18	3	1100310						
	M25XX	✓	15	123.9	122.7	1.52	12	61008303	20	165.1	164.0	1.45	12	61100812												
			15	123.9	122.7	1.52	12	1004342	20	165.1	164.0	1.45	4	1000302	20	165.5	164.0	1.19	6	1001648	24	198.6	196.0	1.20	6	1001653
	M50XX	✓							10	157.2	164.0	1.45	5	1100644	11	174.3	171.3	1.24	5	1100645	12	190.4	197.2	1.20	8	1100762
									10	157.0	164.0	1.45	6	1100647	11	173.8	180.0	1.30	5	1100646						

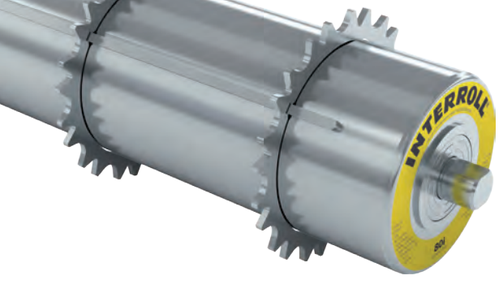


SPROCKETS FOR PLASTIC MODULAR BELTS

Special sprockets based on the specification of modular belt manufacturers

Modular belt manufacturer	Series	Rev.	Sprocket 80i / 80D Z	OD mm	PCD mm	VF	B mm	Art. No.	113i / 113D Z	OD mm	PCD mm	VF	B mm	Art. No.	138i Z	OD mm	PCD mm	VF	B mm	Art. No.	165i Z	OD mm	PCD mm	VF	B mm	Art. No.
Intralox																										
	200														12	197.6	196.0	1.42	4	1003373						
	400	✓													12	194.2	198.0	1.43	3	1100688						
	800	✓	8	124.2	132.0	1.64	6	1101295	10	158.3	164.0	1.45	6	1001642	12	190.0	196.0	1.42	6	1001647	13	206.3	212.0	1.30	6	1100684
	900	✓	12	107.0	105.0	1.30	3	1001603	15	135.0	131.0	1.16	3	1001608	20	178.0	174.0	1.26	3	1001621	22	194.3	191.0	1.17	3	1001628
	1000	✓	22	112.0	107.0	1.33	4	1100381																		
	1100	✓	24	118.5	116.0	1.44	18	61101976	30	147.9	145.0	1.28	18	61100509												
			24	118.5	116.0	1.44	6	1001632	30	147.9	145.0	1.28	6	1001615	35	172.5	170.0	1.23	4	1001626		197.1	194.0	1.18	4	1100648
	1400	✓													21	173.7	170.0	1.23	6	1100649						
	1500	✓	28	118.8	113.0	1.40	6	1001637	36	152.8	146.0	1.29	6	1001643	42	173.7	170.0	1.23	6	1100650						
	1600	✓	14	111.8	114.0	1.42	8	1003371	17	135.3	138.0	1.22	8	1001640	20	162.2	162.0	1.17	8	1001623	24	191.4	193.1	1.18	8	61010643
	2000	✓							16	149.3	165.0	1.46	8	1100652												
	2200														16	198.0	195.0	1.41	8	1100293						
	2400	✓	14	114.2	113.8	1.41	12	61104059																		
			14	114.2	113.8	1.41	6	1100682	19	154.6	154.0	1.36	6	1001613	24	195.0	195.0	1.41	6	1001625	26	211.6	211.0	1.29	6	1001629
Rexnord																										
	880	✓							25	154.20	155.0	1.37	8	1100686	15	184.3	183.0	1.33	10	1100658						
	1010		16	131.5	130.0	1.61	8	1100657																		
Scanbelt																										
	S.12-400	✓	28	117.9	112.0	1.39	4	1100659	36	149.8	143.9	1.27	4	1100257												
	S.25-100		14	113.1	112.0	1.39	4	1100441																		
	S.25-400	✓	13	105.0	104.0	1.29	4	1100138	17	139.2	136.0	1.2	4	1100136	20	163.4	160.0	1.16	4	1100660						
	S.25-830	✓													20	156.8	160.0	1.16	8	1100134						
	S.50-100	✓													12	187.6	195.0	1.41	4	1100160						
	S.50-808	✓							10	164.0	164.0	1.45	8	61010638	12	192.9	189.0	1.37	4	1101267						
	S.50-908	✓																			13	216.4	209.0	1.27	8	1100661
Forbo-Siegling																										
	CM 25	✓	13	108.1	110.0	1.37	3	1100662																		
	LM 25	✓							17	139.4	136.0	1.20	3	1100663	20	163.5	160.0	1.16	3	1100664						
	LM 50	✓																			12	186.0	195.0	1.19	6	1100665
	S5	✓																			23	192.4	185.2	1.13	4	1100685

Refer to the Planning Section from p 178 for help with planning and design



SPROCKETS FOR PLASTIC MODULAR BELTS

Special sprockets based on the specification of modular belt manufacturers

Modular belt manufacturer	Series	Rev.	Sprocket 80i / 80D Z	OD mm	PCD mm	VF	B mm	Art. No.	113i / 113D Z	OD mm	PCD mm	VF	B mm	Art. No.	138i Z	OD mm	PCD mm	VF	B mm	Art. No.	165i Z	OD mm	PCD mm	VF	B mm	Art. No.
Ammeraal Beltech / Uni-Chains	SNB	✓	13	107.8	106.0	1.32	3	1100677	18	146.1	146.0	1.29	3	1001610	20	162.3	162.4	1.18	3	1100242	24	194.8	195.0	1.19	3	1100668
	Flex ONE								13	163.6	163.6	1.4	6	61010644												
	Light	✓	17	105.0	104.0	1.29	4	1100027	24	147.3	146.0	1.29	4	1100670	27	165.7	219.0	1.59	4	1100679						
	Light EP	✓	9	110.6	111.0	1.38	8	1100673	12	147.1	147.2	1.30	8	1100389	14	171.4	171.0	1.24	8	1100671	16	195.8	195.0	1.19	8	1100672
	MPB	✓							9	142.5	149.0	1.32	8	1001644	11	174.2	180.3	1.31	8	1001656	13	205.8	212.0	1.29	8	61100180
	M-SNB & M-QNB	✓	24	99.5	97.0	1.20	5	1001607							44	181.2	178.1	1.29	6	1100380						
	M-SNB	✓													38	156.5	156.4	1.13	5	1001627						
	OPB	✓							10	160.1	169.0	1.5	8	1100674												
	QNB	✓	15	121.50	122.0	1.52	6	1001606	17	137.5	138.0	1.2	6	1001609	21	170.1	170.0	1.23	6	1001650	24	194.4	195.0	1.19	6	1100675
	S-MPB														20	163.8	162.4	1.18	6	1100585						
	SNB M1	✓							18	148.7	146.0	1.29	3	1100676												
	SNB M2	✓	14	119.2	114.0	1.42	3	1100681	17	144.4	138.0	1.22	3	1003093	20	165.7	162.0	1.17	3	1001622	24	199.0	195.0	1.19	3	1004089

Order Information

Different belt variants and materials for standard belt series may affect the operational characteristics and engagement of the belt and drive profile. Although Interroll trys to show the most popular basic profile options in this catalogue, manufacturers are offering new variations of their standard belt series. 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 Interroll with your enquiry:

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

If you didn‘t find your belt type or belt supplier please see updated list on www.interroll.com

BACKSTOPS AND BALANCING

Backstops

Product Description

Backstops prevent roll-back of the belt and load.

Applications

- ✓ Single direction inclined belt conveyors
- ✓ For i-Series drum motors only
- ✓ For preventing run-back of the belt and load when the power supply is off

Characteristics

- ✓ Bearing runs only in one direction
- ✓ No electrical connection necessary
- ✓ Fitted to the rotor shaft
- ✓ Higher holding torque than an electromagnetic brake

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

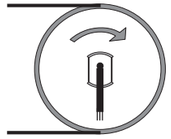


Fig.: Rotation arrow

Product Range

Rotational direction looking from the connector side	Clockwise (standard) Counter-clockwise

Balancing

Product Description

Static or dynamic balancing of the drum motor reduces vibration and out of balance running for sensitive high speed or dynamic weighing applications. Static balancing is applied to the drum motor shell only and the effective result must be tested for each application. Dynamic balancing includes the drum motor rotor, shell and end housings and the effective balance is given in the table below.

Applications

- ✓ High-speed conveyors
- ✓ Dynamic Balancing only for i-Series
- ✓ Weighing equipment
- ✓ Not for AC-PM synchronous motors

Note: Any external modifications, like fixtures, lagging or sprockets, have an impact on the imbalance.

Note: For dynamic balancing please choose only i-series drum motors with stainless steel end housings.

Note: For S-series drum motors only static balancing is possible.

Technical Data

Dynamic balancing	3 g, 5 g, 8 g, 10 g
Tolerance	±2 g
End housing	Solid stainless steel
80i end housing	1 oil plug only supplied
Shell lagging material	Only hot vulcanised NBR may be used

Note: Max. balancing length SL ≤ 800 mm.

ELECTROMAGNETIC BRAKES

Product Description

Applications

Holds a load according to the stated belt pull.

- ✓ For reversible inclined and declined conveyors
- ✓ For reduced stopping times *
- ✓ For stopping and holding loads
- ✓ For approximate positioning *
- ✓ For asynchronous drum motors only

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

Characteristics

- ✓ Low-noise
- ✓ Low-wear
- ✓ Operated by rectifier (see p 138)
- ✓ Applied to the drum motor‘s rotor shaft
- ✓ When power to the motor is disrupted the brake will close (the brake is naturally closed)

Response time

The brake opening and closing response time can vary substantially depending on the following:

- 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)

The difference between AC switching and DC switching is shown in the following table:

	AC switching	**DC switching**
Closing response time	slow	fast
Brake voltage	approx. 1 V	approx. 500 V

Note: For DC-switching, the switching contacts must be protected against damage due to high voltage.

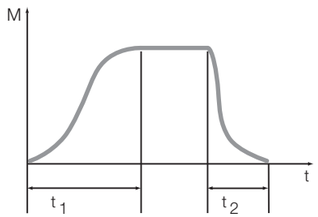


Fig.: Closing and opening response time

t_1 Closing response time
t_2 Opening response time

Reduction of brake torque

The rated brake torque is strongly influenced by the operating conditions within the drum motor (operation in oil at high temperatures) and the ambient temperature. To calculate the holding torque limit on the drum shell, you need to multiply the rated torque of the break with the gear ratio of the drum motor. For safety reasons, the calculated brake torque has to be at least 25% higher than the needed load torque.

Product Range

Drum Motor	Rated torque M	Rated power	Rated voltage	Rated current	DC switching t1	AC switching t1	Opening delay time t2
	Nm	W	V DC	A	ms	ms	ms
113i	1.5	24	24	1.00	26	200	30
138i	2.9	24	24	1.00	26	200	30
165i	5.95	33	24	1.38	46	260	40
217i*	5.95	33	24	1.38	46	260	40
80i	0.7	12	24	0.5	13	80	20
113i	1.5	24	104	0.23	26	200	30
138i	2.9	24	104	0.23	26	200	30
165i	5.95	33	104	0.32	46	260	40
217i	12	50	104	0.48	46	260	40
217i*	5.95	33	104	0.32	60	500	60
80i	0.7	12	104	0.12	13	80	20
113i	1.5	24	207	0.12	26	200	30
138i	2.9	24	207	0.12	26	200	30
165i	5.95	33	207	0.16	46	260	40
217i	12	50	207	0.24	46	260	40
217i*	5.95	33	207	0.16	60	500	60

Note: 217i* = Brake for 217i with min SL= 400 mm.

Refer to the Planning Section from p 178 for help with planning and design

Product Description

Applications

- ✓ For Drum motors with electromagnetic brake (see p 136)
- ✓ Half-wave and bridge rectifier for standard applications
- ✓ Fast acting and multiswitch rectifier for applications in which short opening delay times are necessary

Characteristics

- ✓ External component must be covered or installed in a control box as close to the brake as possible.

Product Range

Input voltage V AC	Brake voltage V DC	Starting voltage V DC	Holding voltage V DC	Version	Application	Art. No.
115	104	104	52	Fast acting rectifier	A or B	61011343
230	207	207	104	Fast acting rectifier	A or B	61011343
230	104	104	104	Half wave rectifier Bridge rectifier	A or B	1001440
230	104	190	52	Phase rectifier	A	1001442
400	104	180	104	Multiswitch	A	1003326
460	104	180	104	Multiswitch	A	1003326
460	207	207	207	Half wave rectifier Bridge rectifier	A or B	1001441

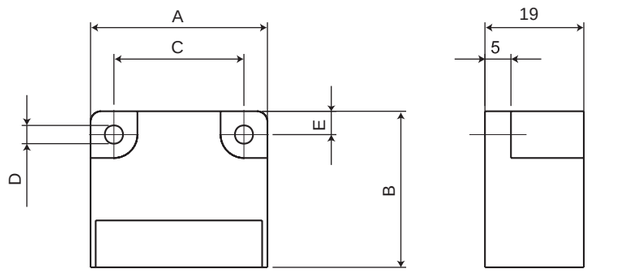
A	Continuous running application
B	Frequent start/stop application

Using a fast acting rectifier or a phase rectifier will save energy because the holding voltage is lower than the starting voltage.

Screened cables should be used to protect against EMC.

Dimensions

Half-wave rectifier and bridge rectifier



Art. No.	A mm	B mm	C mm	D mm	E mm
1001440	34	30	25	3.5	4.5
1001441	64	30	54	4.5	5

Phase rectifier

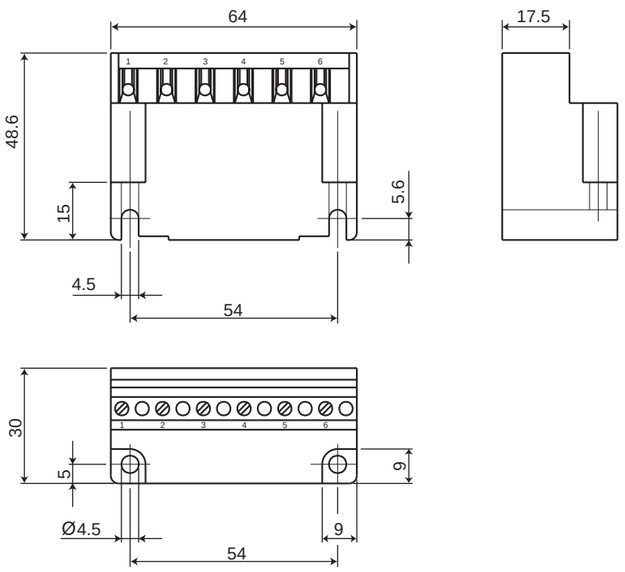


Fig.: 1001442

Fast acting rectifier

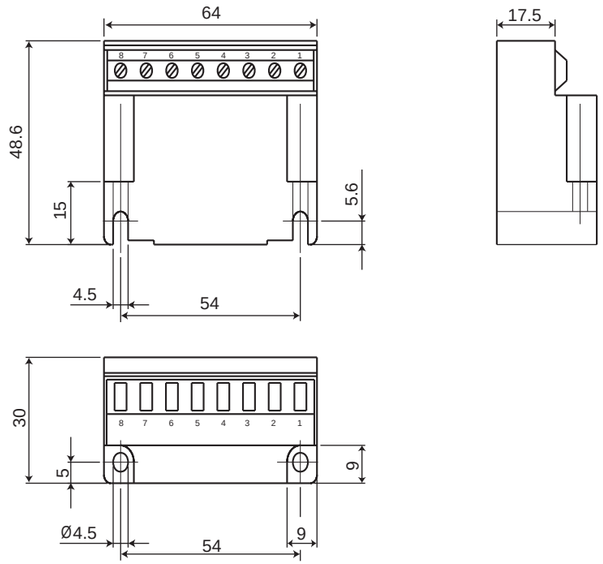


Fig.: 61011343

Multiswitch

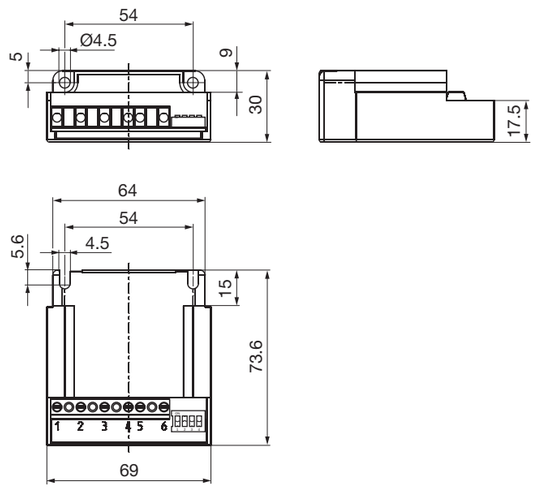


Fig.: 1003326

Connection Diagram

Interroll recommends installing a switch between (3) and (4) for fast brake release.

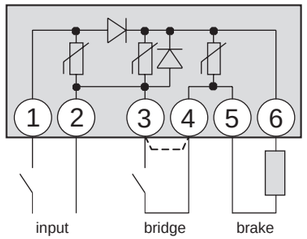


Fig.: Half-wave rectifier

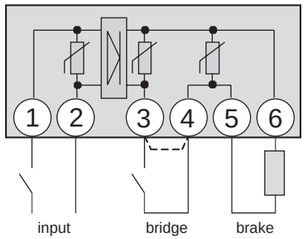


Fig.: Bridge rectifier

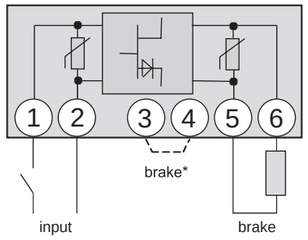


Fig.: Phase rectifier

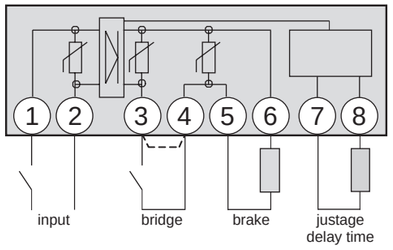


Fig.: Fast acting rectifier

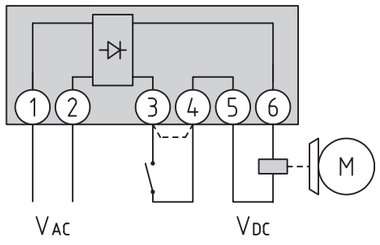


Fig.: Multiswitch

FEEDBACK DEVICES

Accurate monitoring of conveying data

Product Description

Application

- ✓ For applications which require control and monitoring of speed, direction, and position of the drum motor belt or load
- ✓ Enables closed loop system control
- ✓ For i-series and D-series only

Characteristics

- ✓ Cannot be combined with a brake or backstop option
- ✓ Supplies low to high resolution signals to an external control unit
- ✓ Incremental or absolute encoders
- ✓ Coupled to rotor shaft or embedded in the rotor bearing

Note: Not available for i-Series with dual voltage

Product Range

All resolutions and speeds given in the following product range are referring to the rotor shaft. The drum motor gear ratio must be considered to find the values related to the drum shell.

Encoder types		Asynchronous Drum Motors					Synchronous Drum Motors		Connection diagram references (see p 246)
		80i	113i	138i	165i	217i	80D	113D	
SKF 32 incremental encoder *	32 pulses	✓	✓	✓					70
SKF 48 incremental encoder	48 pulses				✓	✓			70
RLS incremental encoder *	64 to 1,024 pulses	✓	✓	✓	✓	✓	✓	✓	71
LTN Resolver	2 poles resolver		✓				✓	✓	72
SKS36 Hiperface	single turn absolute hiperface high resolution						✓	✓	73

Note: *For 80i with encoder the drum motor will be supplied with 25 mm diamter shafts and one supply voltage.
Other feedback devices and resolutions on request

SKF 32 or 48 incremental encoder

Power supply	V_{dd} = 5 to 24 V
Power consumption	max. 20 mA
Electrical interface	Open collector NPN
Output increments	A, B
Increments resolution	32 or 48 pulses / revolution
Necessary Pull-up resistor	270 to 1,500 Ω (see connection diagram section)
max. cable length	10 m

RLS incremental encoder

Power supply	V_{dd} = 5 V ± 5 %
Power consumption	35 mA
Electrical interface	RS422
Output increments	A, B, Z, /A, /B, /Z
Increments resolution	64; 512; 1,024 pulses / revolution 2,048 pulses / revolution (max speed 2,500 rotor rpm)
max. cable length	5 m

Note: Interroll 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

LTN Resolver

Input voltage and current range	7 V
Input frequency range	5 kHz / 10 kHz
Input current	58 mA / 36 mA
Number of poles	2
Transformation ratio	0.5 % ± -10 %
max. cable length	10 m

SKS36 hiperface (Sick/Stegman) *

Power supply	7 to 12 V (recommended 8 V)
Power consumption	max. 60 mA
Data transfer	Hiperface
Serial data	RS485
Single turn resolution	4,096 positions / revolution
Sine/cosine periods per revolution	128
max. cable length	10 m

Note: *For SKS36 hiperface (Sick/Stegman) Please contact your Interroll customer consultant.

ACCESSORIES

- ✓ **Accessories help you integrate the Interroll Drum Motor into your material handling system quickly and efficiently.**
- ✓ **This chapter includes external accessories which can be added to the Interroll Drum Motor during or after installation.**

➲ Mounting Brackets

Anti-vibration bracket	p 146
Light-duty flanged bracket for drum motor	p 148
Light-duty flanged bracket for idler pulley	p 150
Heavy-duty flanged bracket, Aluminium	p 152
Heavy-duty flanged bracket, PE	p 156
Plummer block for drum motor and idler	p 160

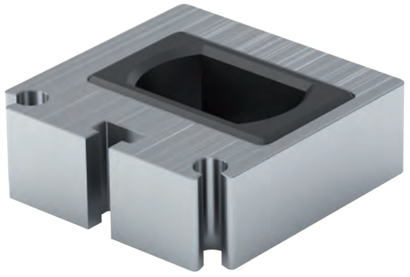
➲ Idler Pulleys

Idler pulley with integral bearing	p 162
Idler pulley without bearing Series 7000	p 168
Idler pulley with bearing Series 7000	p 170

➲ Conveyor Rollers

Conveyor Roller Series 1450	p 172
Universal Conveyor Roller Series 1700	p 174

Refer to the Planning Section from p 178 for help with planning and design



ANTI-VIBRATION BRACKETS

Product Description

Application

- ✓ For Interroll Drum Motor 80S, 113S
- ✓ Anti-vibration bracket with rubber insulation part for reduction of noise and vibration
- ✓ The bracket is designed, so that the drum motor shaft is secured should the rubber become damaged

Reference Number

Article	Art. No.
Anti-vibration Brackets	61103929
Rubber	1000455

Dimensions

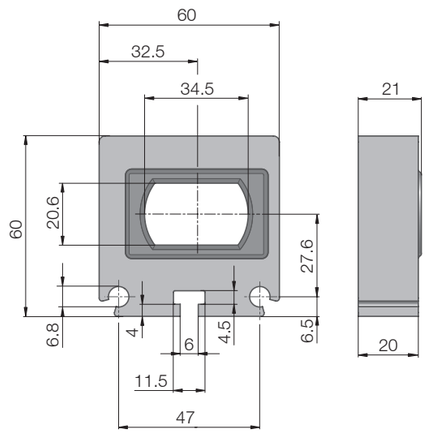


Fig.: Anti-vibration Brackets

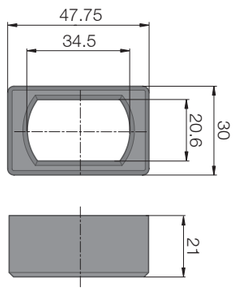


Fig.: Rubber

LIGHT DUTY FLANGED BRACKET FOR DRUM MOTOR

Set of brackets for mounting a drum motor

Product Description

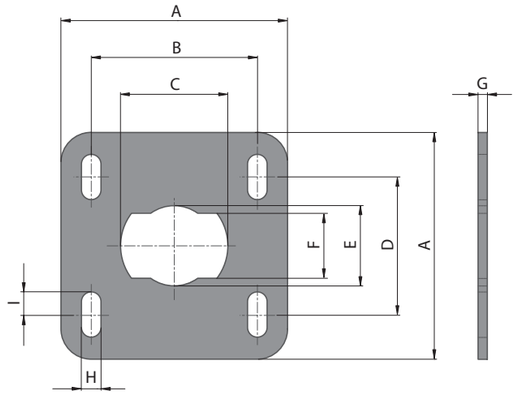
Application

- ✓ For Interroll Drum Motor 80S, 113S

Product Range

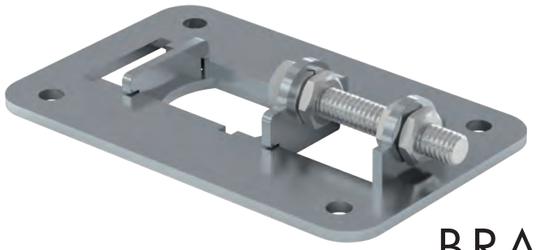
Article	Shaft mm	Material	Art. No.
80S / 113S	21 × 35	Stainless steel	61103896

Dimensions



Shaft mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm
21.0 x 35.0	75.0	55.0	35.5	45.5	26.5	21.5	3.0	6.5	15.0

Refer to the Planning Section from p 178 for help with planning and design



LIGHT DUTY FLANGED BRACKET FOR IDLER PULLEY

Set of brackets for mounting an idler pulley

Product Description

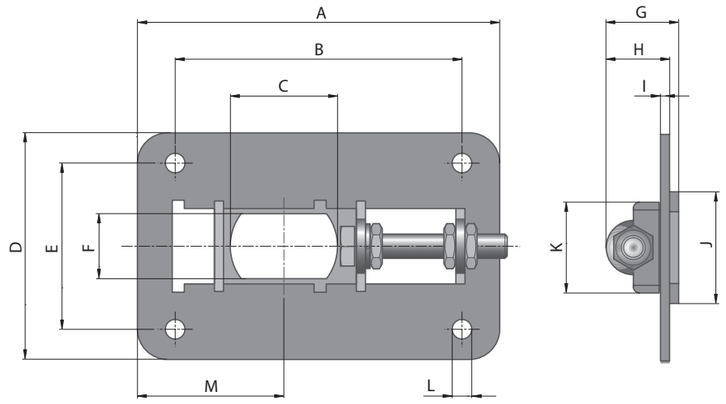
Application

✓ For Interroll Idler Pulley 80S, 113S

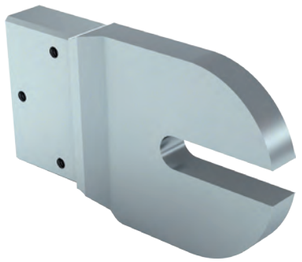
Product Range

Article	Shaft mm	Material	Art. No.
80S / 113S	21 × 35	Stainless steel	61103898

Dimensions



Shaft mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M_{min} mm	M_{max} mm
21.0 x 35.0	120.0	95.0	35.5	75.0	55.0	21.5	24.0	21.0	3.0	37.0	30.0	6.5	35.0	79.0



HEAVY DUTY FLANGED BRACKET ALUMINIUM

Set of brackets for mounting a drum motor or an idler pulley

Product Description

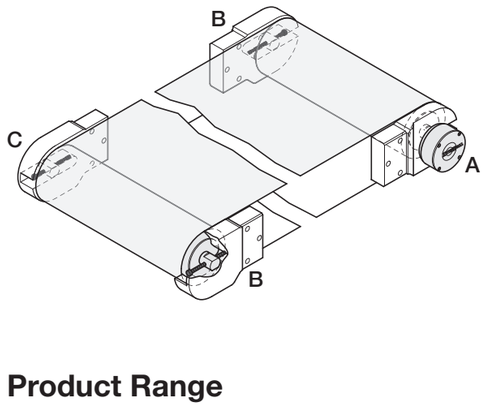
Application

- ✓ For Interroll Drum Motors 80i, 113i, 138i, 165i and corresponding idler pulleys
- ✓ For drum motors with cable connectors or terminal box
- ✓ Only for drum motors with a cross drill thread in the front shaft (non cable / terminal box side)
- ✓ Only for idler pulleys with a threaded hole in each shaft end

Note: For threaded shaft dimensions refer to the dimensional drawings for the respective drum motor.

Mounting Overview

Brackets must be mounted in the following way:



Product Range

Drum Motor	Idler Pulley	Bracket set	Material	Electrical connector	Art. No.
113i		A + B	Aluminium	Elbow connector Straight connector Terminal box	61008698
113i		A + B	Aluminium	Cable slot connector	61008699
138i		A + B	Aluminium	Elbow connector Straight connector Terminal box	61008704
138i		A + B	Aluminium	Cable slot connector	61103900
165i		A + B	Aluminium	Elbow connector Straight connector Terminal box	61008707
165i		A + B	Aluminium	Cable slot connector	61103901
80i		A + B	Aluminium	Elbow connector Straight connector	61008694
	80i	B + C	Aluminium		61008696
	113i	B + C	Aluminium		61008701
	138i	B + C	Aluminium		61008706
	165i	B + C	Aluminium		61008708

Note: 165i only with key flat length of 25 mm (must be ordered specially)

Dimensions

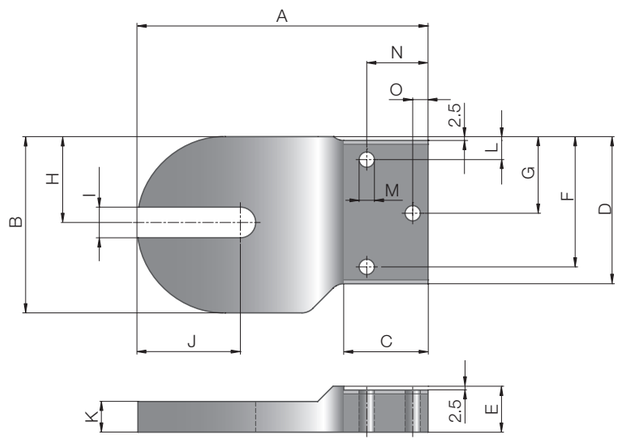
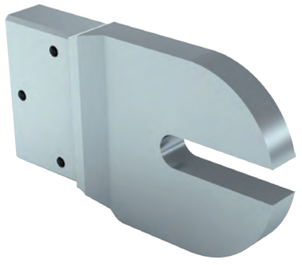


Fig.: Right-hand side bracket (A) for drum motor with elbow connector, straight connector or terminal box

Drum Motor	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M	N mm	O mm
80i	120.0	85.0	25.0	62.5	20.0	50.0	-	40.0	13.5	47.5	9.0	15.0	M8	10.0	-
113i	190.0	115.0	55.0	96.0	30.0	85.0	50.0	56.0	20.0	67.5	20.0	15.0	M8	40.0	10.0
138i	200.0	140.0	55.0	121.0	30.0	110.0	62.5	67.0	20.0	80.0	20.0	15.0	M10	40.0	10.0
165i	240.0	170.0	55.0	146.0	30.0	122.5	75.0	81.0	30.0	100.0	20.0	27.5	M10	40.0	10.0



HEAVY DUTY FLANGED BRACKET ALUMINIUM

Set of brackets for mounting a drum motor or an idler pulley

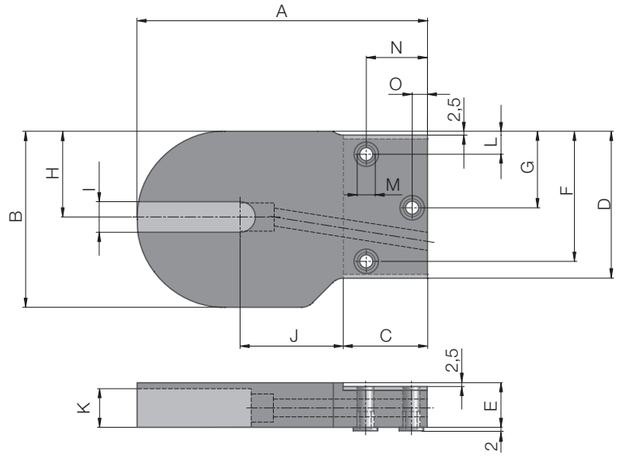


Fig.: Right-hand side bracket (A) for drum motor with cable slot connector

Drum Motor	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M	N mm	O mm
113i	190.0	115.0	55.0	96.0	30.0	85.0	50.0	56.0	20.0	67.5	26.0	15.0	M8	40.0	10.0
138i	200.0	140.0	55.0	121.0	30.0	110.0	62.5	67.0	20.0	80.0	26.0	15.0	M10	40.0	10.0
165i	240.0	170.0	55.0	146.0	30.0	122.5	75.0	81.0	30.0	100.0	26.0	27.5	M10	40.0	10.0

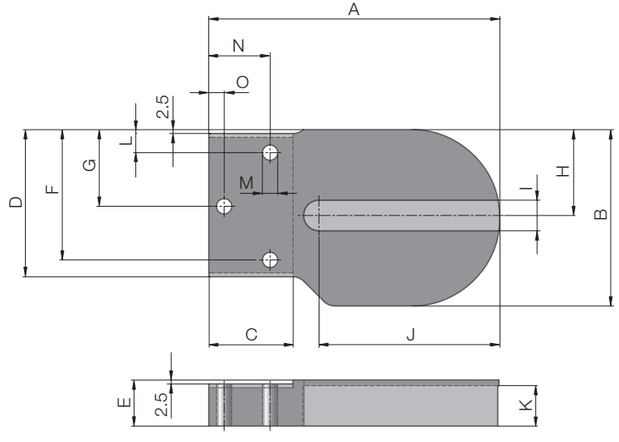


Fig.: Left-hand side bracket (B) for drum motor and idler pulley

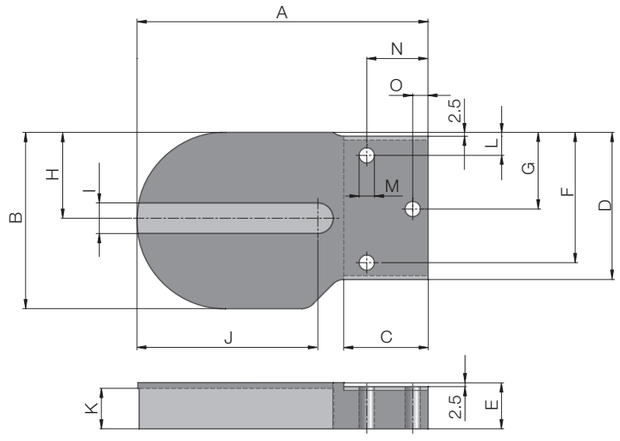
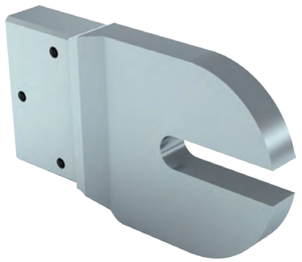


Fig.: Right-hand side bracket (C) for idler pulley

Drum Motor	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M	N mm	O mm
80i	120.0	85.0	25.0	62.5	20.0	50.0	-	40.0	13.5	85.0	13.0	15.0	M8	10.0	-
113i	190.0	115.0	55.0	96.0	30.0	85.0	50.0	56.0	20.0	120.0	26.0	15.0	M8	40.0	10.0
138i	200.0	140.0	55.0	121.0	30.0	110.0	62.5	67.0	20.0	130.0	26.0	15.0	M10	40.0	10.0
165i	240.0	170.0	55.0	146.0	30.0	122.5	75.0	81.0	30.0	165.0	26.0	27.5	M10	40.0	10.0

Refer to the Planning Section from p 178 for help with planning and design



HEAVY DUTY FLANGED BRACKET PE

Set of brackets for mounting a drum motor or an idler pulley

Product Description

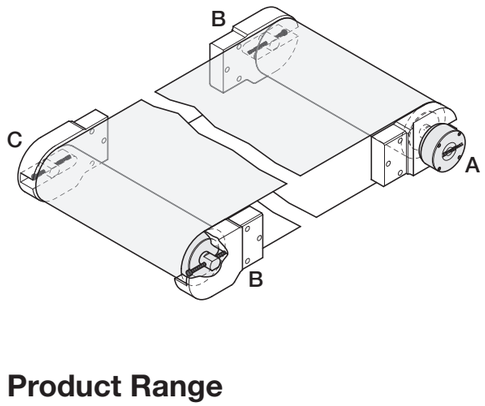
Application

- ✓ For drum motors 80i, 113i, 138i, 165i and corresponding idler pulleys
- ✓ For drum motors with cable connectors or terminal box
- ✓ Only for drum motors with a cross drill thread in the front shaft (non cable / terminal box side)
- ✓ Only for idler pulleys with a threaded hole in each shaft end

Note: For threaded shaft dimensions refer to the dimensional drawings for the respective drum motor.

Mounting Overview

Brackets must be mounted in the following way:



Product Range

One set of brackets comprises of one left-hand bracket and one right-hand bracket.

Drum Motor	Idler Pulley	Bracket set	Material	Electrical connector	Art. No.
113i		A + B	PE	Elbow connector Straight connector Terminal box	61006805
113i		A + B	PE	Cable slot connector	61008697
138i		A + B	PE	Elbow connector Straight connector Terminal box	61008702
138i		A + B	PE	Cable slot connector	61100570
80i		A + B	PE	Elbow connector Straight connector	61008693
	80i	B + C	PE		61008695
	113i	B + C	PE		61008700
	138i	B + C	PE		61008705

Dimensions

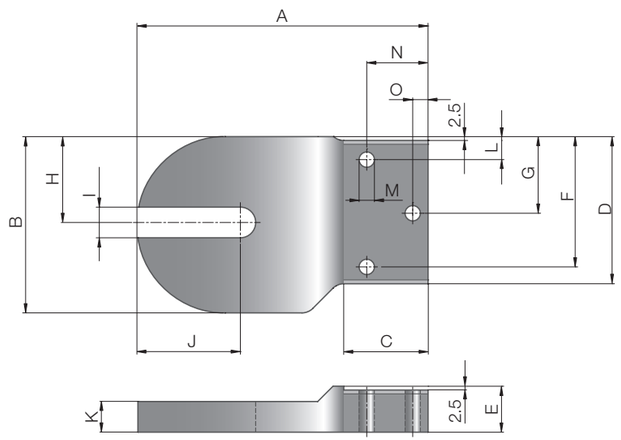
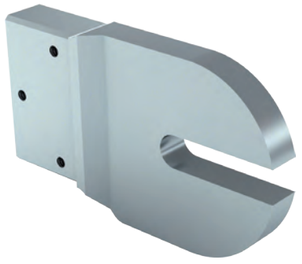


Fig.: Right-hand side bracket (A) for drum motor with elbow connector, straight connector or terminal box

Drum Motor	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M	N mm	O mm
80i	120.0	85.0	25.0	62.5	20.0	50.0	-	40.0	13.5	47.5	9.0	15.0	M8	10.0	-
113i	190.0	115.0	55.0	96.0	30.0	85.0	50.0	56.0	20.0	67.5	20.0	15.0	M8	40.0	10.0
138i	200.0	140.0	55.0	121.0	30.0	110.0	62.5	67.0	20.0	80.0	20.0	15.0	M10	40.0	10.0



HEAVY DUTY FLANGED BRACKET PE

Set of brackets for mounting a drum motor or an idler pulley

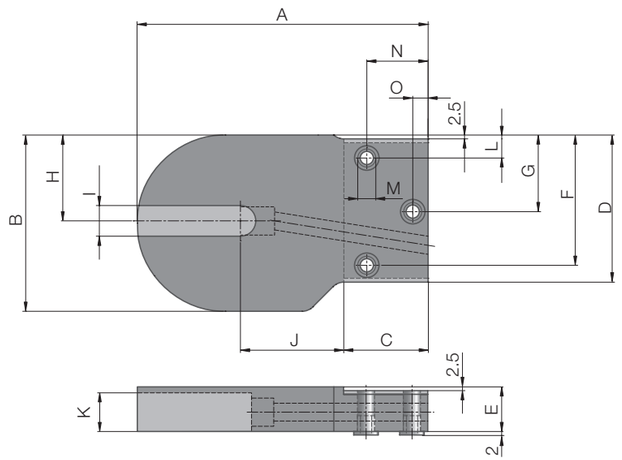


Fig.: Right-hand side bracket (A) for drum motor with cable slot connector

Drum Motor	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M	N mm	O mm
113i	190.0	115.0	55.0	96.0	30.0	85.0	50.0	56.0	20.0	67.5	26.0	15.0	M8	40.0	10.0
138i	200.0	140.0	55.0	121.0	30.0	110.0	62.5	67.0	20.0	65.0	26.0	15.0	M10	40.0	10.0

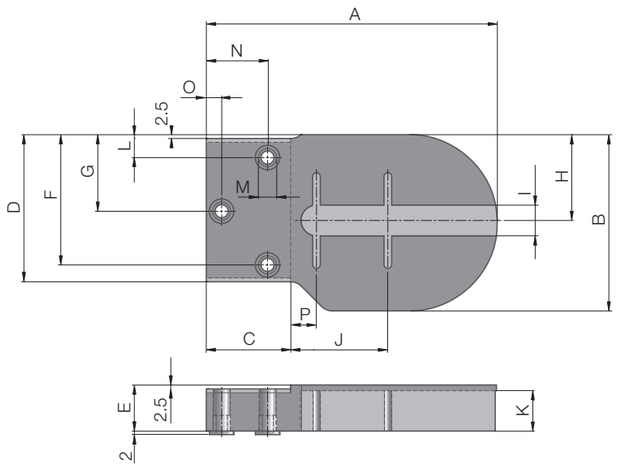


Fig.: Left-hand side bracket (B) for drum motor and idler pulley

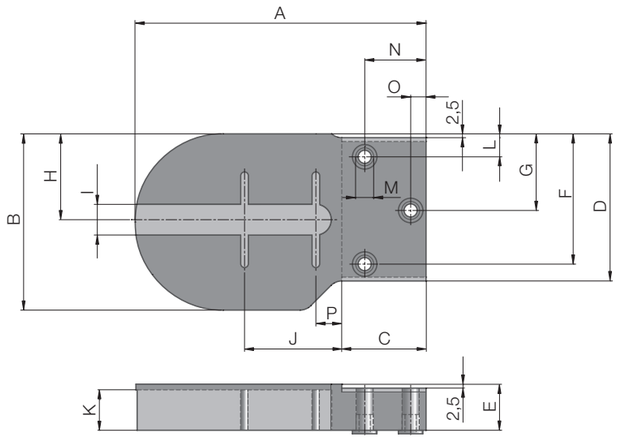
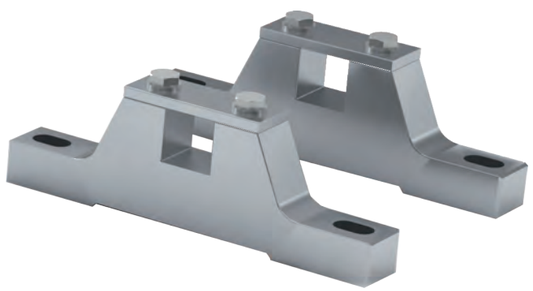


Fig.: Right-hand side bracket (C) for idler pulley

Drum Motor / Idler Pulley	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M	N mm	O mm	P mm
80i	120.0	85.0	25.0	62.5	20.0	50.0	-	40.0	13.5	42.5	13.0	15.0	M8	10.0	-	12.5
113i	190.0	115.0	55.0	96.0	30.0	85.0	50.0	56.0	20.0	60.0	26.0	15.0	M8	40.0	10.0	17.5
138i	200.0	140.0	55.0	121.0	30.0	110.0	62.5	67.0	20.0	60.0	26.0	15.0	M10	40.0	10.0	15.0



PLUMMER BLOCK BRACKET FOR DRUM MOTOR AND IDLER PULLEY

Set of brackets for mounting an idler pulley

Product Description

Application

- ✓ For Drum Motors and Idler Pulleys 80i, 113i, 138i, 165i and 217i
- ✓ For Drum Motors and Idler Pulleys 80D and 113D

Product Range

Drum Motor	Material	Art. No.
80i	Aluminum	61008580
113i	Aluminum	61008581
138i	Aluminum	61008582
165i/217i	Cast iron	61009983
	Stainless steel	61100431
80D	Aluminium	61010381
113D	Aluminium	61010382

Dimensions

Brackets for Asynchronous Motors

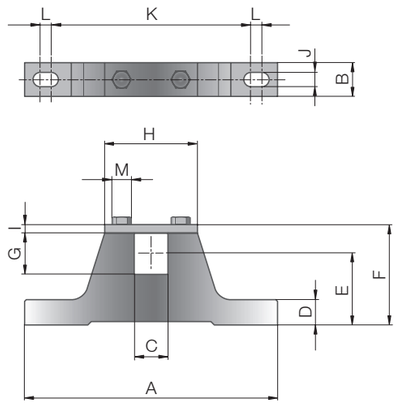


Fig.: Bracket 80i - 217i

Drum Motor	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M	Material	Weight kg
80i	100.0	10.0	13.5	12.0	35.0	47.5	16.5	35.0	4.0	6.5	72.5	7.5	M6	Alu	0.14
113i	150.0	20.0	20.0	15.0	42.0	59.5	24.5	55.0	5.0	8.5	118.5	6.5	M6	Alu	0.50
138i	150.0	20.0	20.0	15.0	44.5	64.5	29.5	55.0	5.0	8.5	118.5	6.5	M6	Alu	0.52
165i/217i	170.0	20.0	30.0	20.0	50.0	75.0	39.5	70.0	5.0	11.0	116.0	14.0	M8	Stainless steel	0.80
165i/217i	187.0	40.0	30.0	22.0	50.0	75.0	36.0	72.0	5.0	14.0	110.0	20.0	M10	Cast iron	1.30

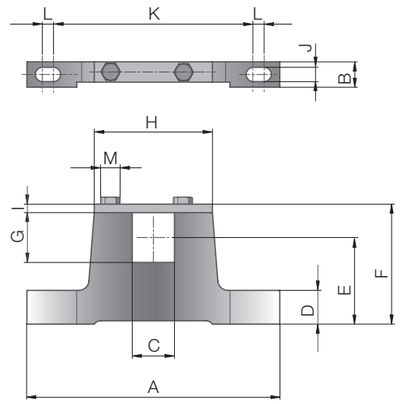
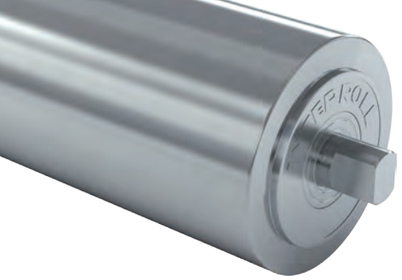


Fig.: Bracket 80D, 113D

Drum Motor	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M	Material	Weight kg
80D	150.0	15.0	25.0	20.0	51.0	71.0	29.5	70.0	5.0	8.5	108.0	12	M6	Alu	0.20
113D	150.0	15.0	25.0	20.0	66.5	101.0	29.5	70.0	5.0	13.0	108.0	12	M6	Alu	???



IDLER PULLEY WITH INTEGRAL BEARINGS

Product Description

Characteristics

- ✓ Static shaft
- ✓ Precision-machined shell
- ✓ Integral bearings
- ✓ Dimensions match drum motors

Technical Data

Protection rate	IP66 / IP69k (only for D-Series)
Max. belt tension	See equivalent drum motor
Max. belt speed	See equivalent drum motor
Shell length	See equivalent drum motor
Internal shaft sealing system	Lip seal FPM
External shaft sealing system S-series	Deflection seal, NBR
External shaft sealing system i-series	Labyrinth
External shaft sealing system D-series	Deflection seal PTFE (for IP69K)

Versions

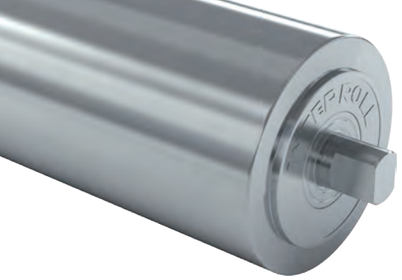
For idler pulleys you can choose the following versions of drum body components:

Component	Option	Series	Material			
			Aluminium	Mild steel	Stainless steel	PTFE
Shell	Crowned	S + i +D		✓	✓	
	Cylindrical	S + i +D		✓	✓	
	Cylindrical + key for using sprockets	i + D		✓	✓	
End housing	Standard	S + i	✓		✓	
		D			✓	
	With grooves and chain sprockets	i only	✓		✓	
Shaft cap	Standard	S	✓			
	Regreasable	S			✓	
Shaft	Standard	i		✓	✓	
		D			✓	
	Cross-drilled thread	i + D		✓	✓	
External seal	Galvanised labyrinth	i		✓		
	Labyrinth	i			✓	
	Labyrinth with FPM	i			✓	
	Deflection seal in PTFE (for IP69k)	D			✓	

Note: For cross-drilled and threaded shaft dimensions refer to the dimensional drawings of the respective drum motor.

Options

- Lagging for friction drive belts, see p 116
- Lagging for plastic modular belts, see p 122
- Lagging for positive drive solid homogeneous belts, see p 126
- Sprockets for plastic modular belts (use cylindrical shell with key), see p 128



IDLER PULLEY WITH INTEGRAL BEARINGS

Dimensions

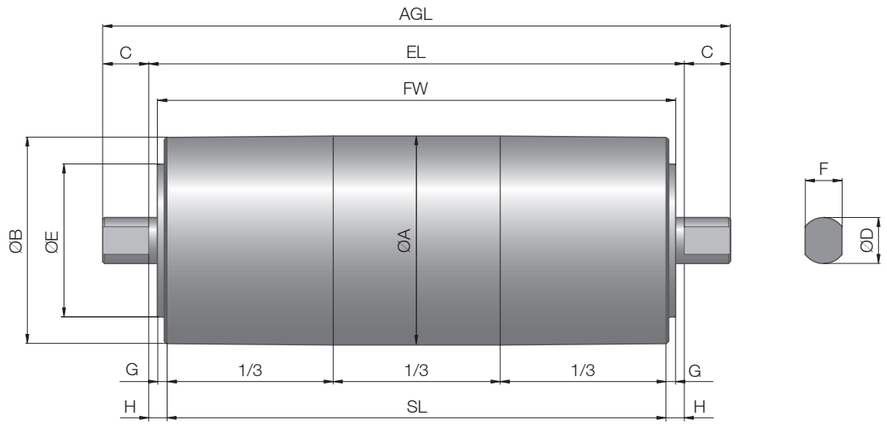


Fig.: Idler i-series

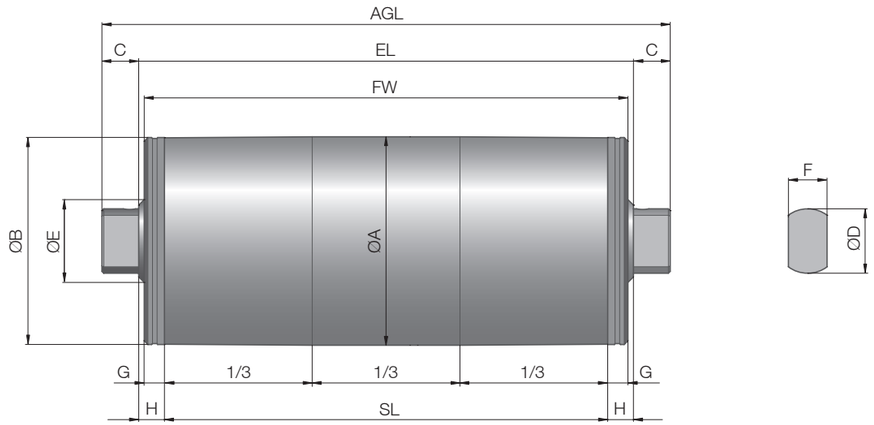


Fig.: Idler S-series

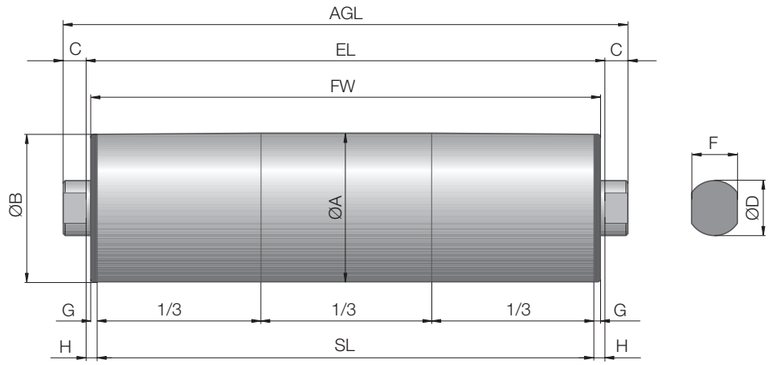


Fig.: Idler D-Series (80D, 113D)

Idler pulley, crowned shell	Ø A mm	Ø B mm	C mm	Ø D mm	Ø E mm	F mm	G mm	H mm
80S with SL 260 mm to 602 mm	81.5	80	20	35	45	21	5	8
80S with SL 603 mm to 952 mm	83	81	20	35	45	21	5	8
80i	81.5	80.5	12.5	17	43	13.5	3.5	6
113S	113.3	112.3	20	35	45	21	11	14
113i	113.5	112	25	25	83	20	5.3	10
138i	138	136	25	30	100	20	6.5	15
165i	164	162	45	40	130	30	8.5	20
217i	217.5	215.5	45	40	130	30	8.5	20
80D	81.5	80.5	12.5	30		25	3.5	6
113D	113.5	112	12.5	30		25	3.5	6

Standard length and weight

The idler pulleys weight depends on its length.

80S

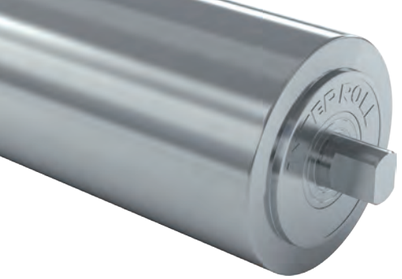
Shell length SL in mm	260	270	285	302	352	402	452	502	552	602	652	702	752
Average weight in kg	2.2	2.3	2.4	2.5	2.85	3.2	3.55	3.9	4.25	4.6	7.0	7.5	8.0
Shell length SL in mm	802	852	902	952									
Average weight in kg	8.5	9.0	9.5	10.0									

80i

Shell length SL in mm	193	243	293	343	393	443	493	543	593	643	693	743	793
Average weight in kg	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.5	5.1	5.7	6.3	6.9
Shell length SL in mm	843	893	943	993	1,043	1,093							
Average weight in kg	7.5	8.1	8.7	9.3	9.9	10.5							

113S

Shell length SL in mm	240	290	340	390	440	490	540	590	640	690	740	790	840
Average weight in kg	3	3.4	3.8	4.2	4.6	5.0	5.4	5.8	6.2	6.6	7.0	7.4	7.8



IDLER PULLEY WITH INTEGRAL BEARINGS

113S

Shell length SL in mm	890	940	990	1,040	1,090
Average weight in kg	8.2	8.6	9.0	9.4	9.8

113i

Shell length SL in mm	250	300	350	400	450	500	550	600	650	700	750	800	850
Average weight in kg	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5
Shell length SL in mm	900	950	1,000	1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400		
Average weight in kg	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	20.5		

138i

Shell length SL in mm	300	350	400	450	500	550	600	650	700	750	800	850
Average weight in kg	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0
Shell length SL in mm	900	950	1,000	1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450
Average weight in kg	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	20.5	21.5	22.5	23.5
Shell length SL in mm	1,500	1,550	1,600									
Average weight in kg	24.5	25.5	26.5									

165i

Shell length SL in mm	400	450	500	550	600	650	700	750	800	850	900	950
Average weight in kg	14	15.5	17.0	18.5	20.0	21.5	23.0	24.5	26.0	27.5	29.0	30.5
Shell length SL in mm	1,000	1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550
Average weight in kg	32.0	35.0	38.0	41.0	44.0	47.0	50.0	53.0	56.0	59.0	62.0	65.0
Shell length SL in mm	1,600	1,650	1,700	1,750								
Average weight in kg	68.0	71.0	74.0	77.0								

217i

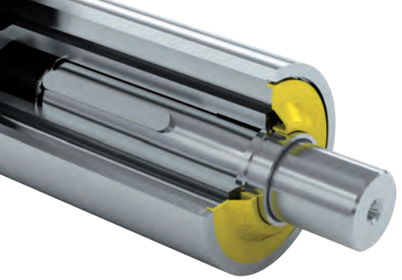
Shell length SL in mm	500	550	600	650	700	750	800	850	900	950	1,000
Average weight in kg	23	25	27	29	31	33	35	37	39	41	43
Shell length SL in mm	1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550
Average weight in kg	47.0	51.0	55.0	59.0	63.0	67.0	71.0	75.0	79.0	83.0	87.0
Shell length SL in mm	1,600	1,650	1,700	1,750							
Average weight in kg	91.0	95.0	99.0	103.0							

80D

Shell length SL in mm	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
Average weight in kg	3.5	4.0	4.4	4.9	5.3	5.8	6.2	6.7	7.1	7.6	8.0	8.5	8.9	9.4	9.8

113D

Shell length SL in mm	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
Average weight in kg	5.4	6.1	6.9	7.6	8.3	9.0	9.7	10.5	11.2	12.0	12.6	13.3	14.0	14.8	15.5



IDLER PULLEY WITHOUT BEARINGS SERIES 7000

Product Description

Characteristics

- ✓ Shrink-fit mounting of bearings on the axle journal
- ✓ Precision-machined items with steel journals and aluminium profile
- ✓ Reduced rotating mass, compared with conventional steel units

Technical Data

Shell material	Aluminium
Max. belt speed	2 m/s
Max. load capacity	Type of bearing related N
Ambient temperature	-5 to +60 °C
Shaft pin	Steel

Maximum load capacity

When ordering an idler pulley without bearings the max. load has to be calculated by the customer.

- Max. allowed tube deflection 0.7 mm
  - Ø 62.5 mm: Ix = 503,000 N/mm^4
  - Ø 79.5 mm: Ix = 1,070,000 N/mm^4
  - Ø 91 mm: Ix = 1,500,000 N/mm^4
- Allowed stress: 17.4 N/mm^2
- Lifetime calculation followed by the recommendations of the bearing manufacturer.

Product Range

Ø mm	Art. No.
62.5	MI-07160A
79.5	MI-07180A
91.0	MI-07190A

Dimensions

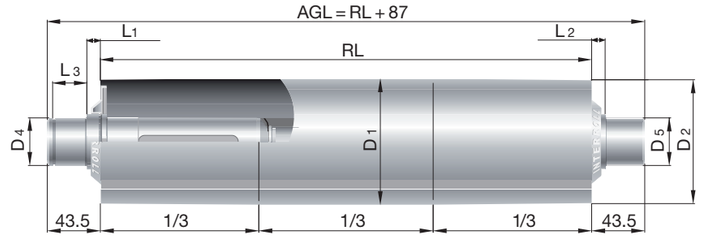


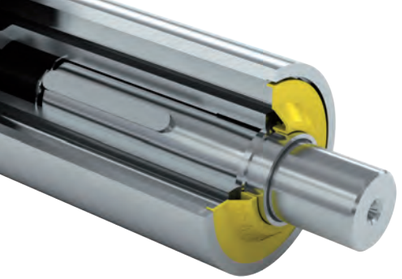
Fig.: Idler series 7000

Ø D1 mm	Ø D2 mm	IT Class mm
62.5	61.1	7
79.5	78.1	7
91.0	89.6	7

The single-side locking recess provides axial fixing of the bearing to provide for a fixed-point side.

Order information

Please indicate all other dimensions for drive journals or extensions. Please indicate the values for shaft diameter values D4 and D5 and length dimensions L1 to L3. Only when this information is provided, together with the reference number and reference length RL, is an order complete and only then can it be processed.



IDLER PULLEY WITH BEARINGS SERIES 7000

Product Description

Characteristics

- ✓ Standard interface with bearing housings provided with inside thread for attachment to belt section profile or to tensioning stations
- ✓ Shrink-fit mounting of bearings on the axle journal
- ✓ Precision-machined items with steel journals and aluminium profile
- ✓ Reduced rotating mass, compared with conventional steel units
- ✓ Allowed stress 17.4 N/mm²

Technical Data

Shell material	Aluminium
Max. belt speed	2 m/s
Max. load capacity	4,300 N
Ambient temperature	-5 to +60 °C
Shaft pin	Steel
Ball bearing	Steel, 2205 2RS / Steel, 2206 2RS
Bearing housing	Steel, burnished

Max. dynamic load capacity in N

Ø 62.5 mm

RL	Rpm						
	150	200	250	300	350	400	450
	in m/s						
	0.50	0.66	0.82	1.00	1.15	1.32	1.50
300	4,000	3,700	3,400	3,200	3,000	2,900	2,800
500	3,800	3,400	3,100	2,900	2,800	2,600	2,500
700	3,000	2,600	2,300	2,100	2,000	1,800	1,700
1,000	2,400	2,000	1,700	1,500	1,400	1,200	1,100

Ø 79.5 mm

RL	Rpm						
	150	200	250	300	350	400	450
	in m/s						
	0.50	0.66	0.82	1.00	1.15	1.32	1.50
300	4,300	3,900	3,650	3,450	3,250	3,100	3,000
500	3,950	3,550	3,300	3,100	2,900	2,750	2,650
700	3,500	3,100	2,850	2,600	2,450	2,300	2,200
1,000	3,150	2,750	2,500	2,250	2,100	1,950	1,850

Ø 91.0 mm

RL	Rpm					
	150	200	250	300	350	400
	in m/s					
	0.50	0.66	0.82	1.00	1.15	1.32
300	4,300	3,900	3,650	3,450	3,250	3,100
500	4,200	3,800	3,550	3,300	3,150	3,000
700	4,100	3,700	3,450	3,200	3,050	2,900
1,000	3,950	3,550	3,300	3,050	2,900	2,750

The maximum static load resulting from preset belt tensioning is as follows:

- Ø 62.5 mm = 6,000 N
- Ø 79.5 mm = 8,000 N
- Ø 91.0 mm = 8,000 N

Product Range

Ø mm	Art. No.
62.5	MI-07160B
79.5	MI-07180B
91.0	MI-07190B

Dimensions

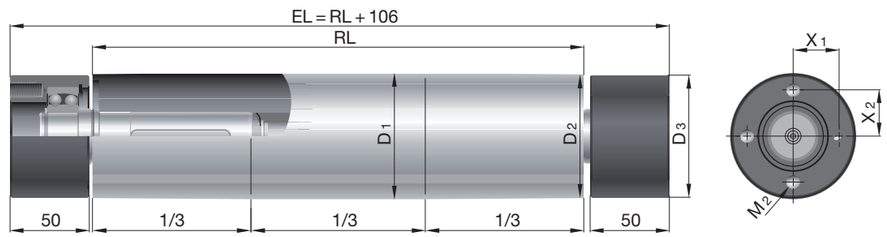
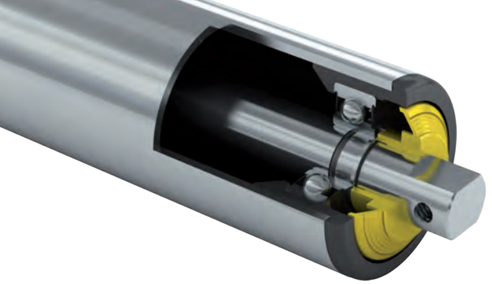


Fig.: Idler series 7000

Ø D1 mm	Ø D2 mm	Ø D3 Bearing housing mm	X1 / X2 mm	M2
62.5	61.1	59.0	23.0	M8
79.5	78.1	75.0	29.0	M10
91.0	89.6	88.6	35.0	M10



CONVEYOR ROLLER SERIES 1450

Product Description

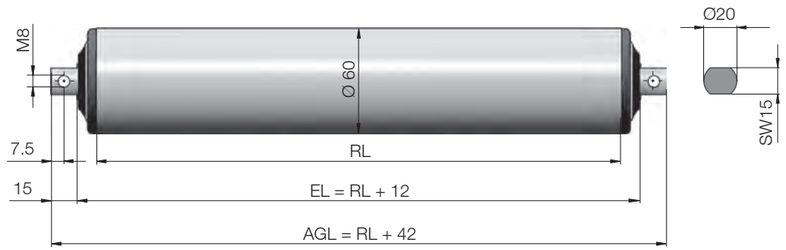
Characteristics

- ✓ Suitable as snub, bend, take-up or tensioning pulleys or feed pulleys at motor stations for belt conveyors
- ✓ Edges of roller rounded
- ✓ Secure bearing seating
- ✓ Quiet running, due to the use of polymer bearing bases and seals
- ✓ Sealing lips in front of ball bearings as protection against ingress of dirt

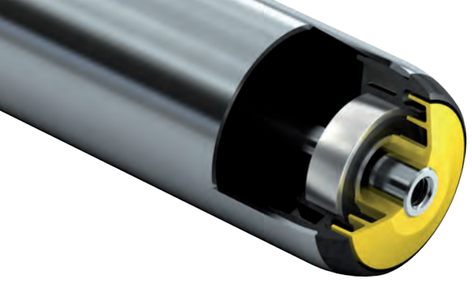
Technical Data

General technical data	
Max. load capacity	5,000 N
Dimensions	
Tube diameter	60 x 3 mm
Max. conveyor speed	0.8 m/s
Temperature range	-5 to +40 °C
Materials	
Bearing housing	Polyamide
Seal	Polyamide
Ball bearing	6205 2RZ
Rubber lagging	yes

Product Range



Tube material	Art. No.
Steel, bright	RD-1.88J.B6S.S6D
Steel, galvanised	RD-1.88J.J6S.S6D



UNIVERSAL CONVEYOR ROLLER SERIES 1700

Silent conveyor rollers for heavy-duty loads

Product Description

Applications

- ✓ Suitable as support roller and return roller

Characteristics

- ✓ Ball bearings are precision sealed
- ✓ Axial fixing of bearing housing, ball bearing, and seal is form-fitted
- ✓ Tube has rounded ends

Technical Data

General technical data	
Max. load capacity	3,000 N
Dimensions	
Max. conveyor speed	2.0 m/s
Temperature range	-5 to +40 °C
Materials	
Bearing housing	Polyamide
Seal	Polypropylene
Ball bearing	6003 2RZ Steel 6002 2RZ

Product Range

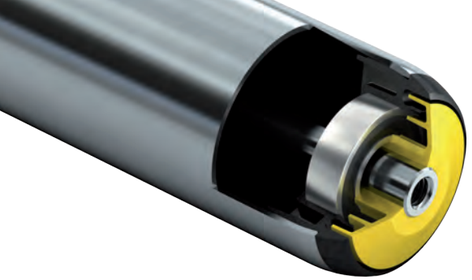
Spring-loaded shaft version

Tube Material	Ø mm	Torque transmission	Sleeve	Ball bearing	Art. No.
Steel, zinc-plated	40 x 1.5	Without grooves	PVC, 5 mm	6002 2RZ	RD-1.7W5.JF5.VAB
		Without grooves	–	6002 2RZ	RD-1.7W5.JF4.VAB
	50 x 1.5	Without grooves	PVC, 2 mm	6002 2RZ	RD-1.7W5.J72.VAB
		Without grooves	–	6002 2RZ	RD-1.7X5.JAA.VAB
	60 x 1.5	Without grooves	–	6002 2RZ	RD-1.7Y5.JAB.VAB

Female threaded shaft version

Tube Material	Ø mm	Torque transmission	Sleeve	Ball bearing	Art. No.
Steel, zinc-plated	40 x 1.5	Without grooves	–	6002 2RZ	RD-1.7W4.JF4.NAE
		Without grooves	PVC, 5 mm	6002 2RZ	RD-1.7W4.JF5.NAE
	50 x 1.5	Without grooves	–	6002 2RZ	RD-1.7X4.JAA.NAE
		Without grooves	PVC, 2 mm	6002 2RZ	RD-1.7X4.J72.NAE
	60 x 1.5	Without grooves	–	6002 2RZ	RD-1.7Y4.JAB.NAE

Refer to the Planning Section from p 178 for help with planning and design



UNIVERSAL CONVEYOR ROLLER SERIES 1700

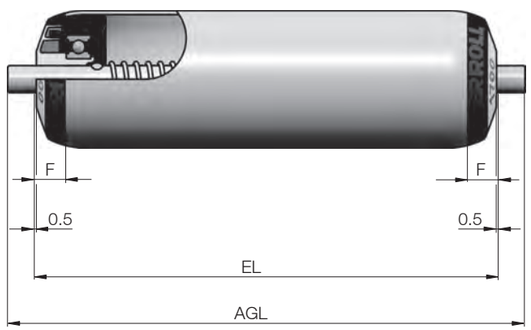
Silent conveyor rollers for heavy-duty loads

Dimensions for spring-loaded shaft version

Dimensions

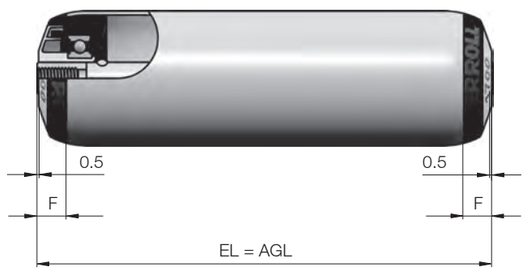
RL	Reference length/Ordering length*
EL	Installation length
AGL	Total length of shaft
F	Length of the bearing assembly, including axial play

*The reference length/ordering length RL does not have any reference points on the conveyor roller and can therefore not be shown.



Ø Shaft mm	Ø Tube mm	RL mm	AGL mm	F mm
11 hex	50 / 60	EL - 10	EL + 22	11

Dimensions for female threaded shaft version



Ø Shaft mm	Thread mm	Ø Tube mm	RL mm	AGL mm	F mm
14	M8 x 15	50 / 60 / 80	EL - 10	EL	11
17	M12 x 20	50 / 60	EL - 10	EL	11

Refer to the Planning Section from p 178 for help with planning and design

PLANNING SECTION

What is the purpose of the Planning Section?

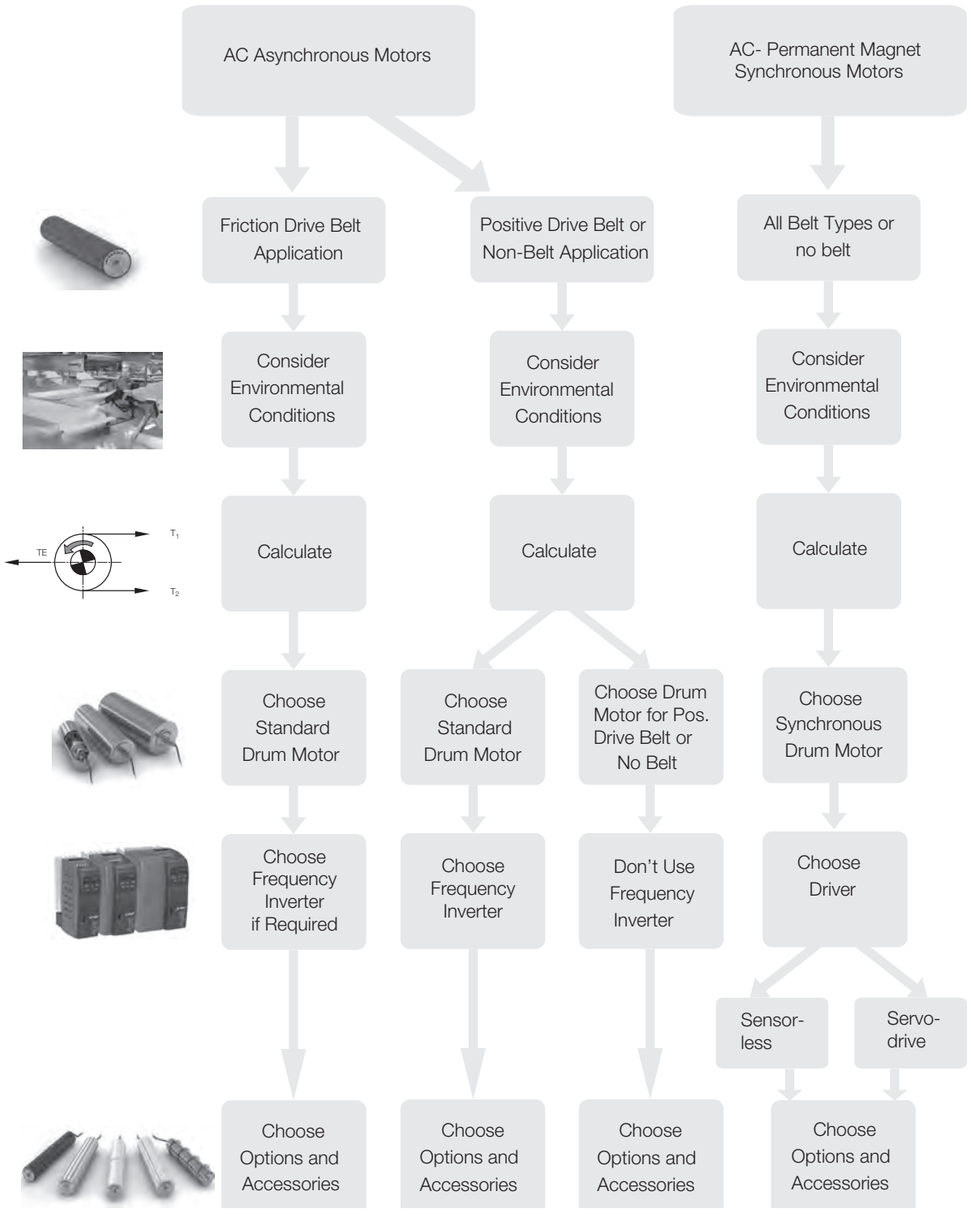
The Planning Section assists you in choosing a suitable drum motor and selecting components. The Planning Section provides you with:

- Information on applications, industries and environmental conditions
- Aids for calculating belt pull and power
- Extensive descriptions of drum body versions

Planning Information

Choosing the right drum motor	p 180
Choosing the right drive control	p 182
Application basics	p 184
Environmental conditions	p 188
Industrial solutions	p 196
Design guidelines	p 200
Calculation guide and selection	p 218
Frequency inverter for Asynchronous Drum Motors	p 224
Material specification	p 226
Connection diagrams	p 240

CHOOSING THE RIGHT DRUM MOTOR



What is your particular application?

- Application with friction drive belts like flat belts?, see p 194
- Application with positive drive belts, such as plastic modular belts or solid homogeneous belts?, see p 195
- Non-belt application?, see p 196

What are your specific environmental conditions?

- Low or high temperature?, see p 201/202
- Dry or wet?, see p 200
- Hygienic requirements?, see p 198
- Consider the environmental conditions and decide on the material version

What is your industry?

- General logistics?, see p 206
- Food processing?, see p 207
- Airport logistics?, see p 208

What is the design of your conveyor?

- What is the type of your conveyor?, see p 212
- How do you wish to control the conveyor system?, see p 223
- Any mounting requirements?, see p 225

How to calculate and select a drum motor?

- Calculate the appropriate belt pull and other friction factors, see p 229/230
- Consider the belt tension and elongation, see p 230
- Consider the type of load and the loading method, see p 233
- Choose the smallest diameter after considering all of the above, see p 233

What options or accessories do you need?

- Sprockets or rubber lagging?, see p 121 and further details on p 116
- Brakes, backstop or feedback?, see p 134
- Mounting brackets, idler pulleys or other accessories?, see p 144

Complete the Configurators at the end of the catalogue.

CHOOSING THE RIGHT DRIVE CONTROL

Choosing the right Drive Control

Before choosing a Drum Motor it is important to know; which type of motor, the type of transmission and the drive control system required for your application. Interroll will be pleased to advise you of the best drive solution for your needs; however this section will help and guide you through the process to reach the correct choice of Drum Motor.

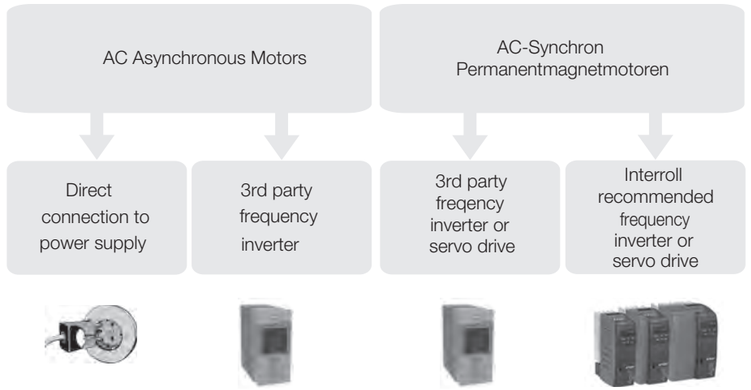
Do you need an Asynchronous or Synchronous motor?

Asynchronous motors are low cost, easy to install and can be connected directly to the mains supply or to a frequency inverter and can be fitted with a feedback system. They are used in many basic conveying applications in logistics, airports and food processing etc. However, compared to Synchronous motors, they are less efficient and have limitations for acceleration, start/stop and positioning. Synchronous motors require a frequency inverter or servo drive in order to operate and so installation costs can therefore be higher. However, the energy savings alone can give a return on investment within two years. Interroll Synchronous motors have a power loss of only 9% and the steel planetary gearbox transfers 92-95% of the available power directly to the conveyor system. Where a high torque dynamic drive is required, a wide speed range, or when high duty cycles are necessary. Where fast acceleration / deceleration or positioning is a demand then the Permanent magnet highly efficient synchronous motor would be the correct choice.

What drive control system do you need?

As for any drive system, when choosing a drum motor you must also think about the method of control and sophistication that is needed to optimize your application. The motor and control system should therefore be decided upon right from the outset to ensure the most efficient and trouble free operation. Interroll is able to offer a number of straight forward easy to use drive & control solutions from their standard product range. Please see control guide matrix on p 183:

Control Guide Matrix



Direct connection to power supply	✓		
Voltage controlled frequency	✓		
Sensorless vector control	✓	✓	✓
Closed loop operation	✓	✓	✓

APPLICATION BASICS

Most Interroll Drum Motors are used for unit handling conveyors to handle packages, boxes, cartons, small pallets, or any other unit format. Either friction or positive drive belts can be used with asynchronous drum motors for applications with positive drive belts or no belts, or synchronous drum motors, depending on your application.

Examples of applications:

- Logistics, such as postal sorting, distribution centres
- Airport baggage handling
- Seafood, meat and poultry
- Bakeries
- Fruit and vegetables
- Beverage and brewing industry
- Snacks
- Packaging weighing equipment

Friction Drive Belts

Friction drive belts use the friction between the drum motor shell and belt to drive the belt. The drum motor is normally crowned to prevent belt wander. The belt must be tensioned in order to transmit the torque from the drum motor. The top surface of the belt can be flat, plain or have a ribbed, grooved or diamond pattern.

Suitable drum motor

- Standard asynchronous drum motors with crowned shell
- Motors for applications with positive drive belts or no belts with crowned shell
- Synchronous drum motors with crowned shell

Torque transmission

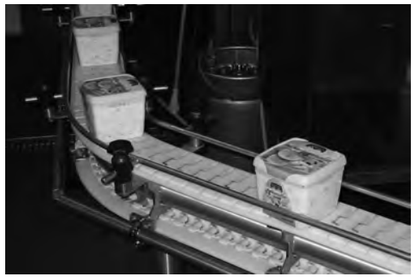
Crowning of the shell is the simplest way to ensure central belt tracking.

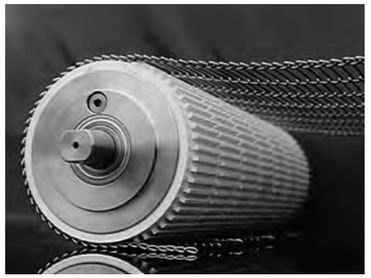
Lagging

Interroll supplies a complete range of hot or cold vulcanised lagging in various materials in order to increase friction between the belt and drum shell.

For more detailed information, refer to p 201.

Positive Drive Belts





Plastic modular belts, solid homogeneous belts, steel mesh or wire belts are positively driven with no tension. Because the belt has very little direct contact with the drum shell, heat dissipation is less effective and therefore the drum motor should be used in conjunction with a frequency inverter optimised for this application. Alternatively a motor for applications with positive drive belts or no belts, or a synchronous drum motor can be used.

Positive drive belts use less power consumption than friction drive belts, allowing longer conveyor constructions. Because these belts are not tensioned, there is less stress on the bearings and internal parts of the drum motor resulting in a longer service life.

Suitable drum motors

- i-series standard asynchronous drum motors 80i to 217i with frequency inverter
- Motors for applications with positive drive belts or no belts
- Synchronous drum motors
- When sprockets are required, choose cylindrical shell with key
- When using a frequency inverter for asynchronous drum motors, it is important to use its setup function to derate the motor and prevent thermal overload

Torque transmission

Interroll recommends the use of profiled lagging wherever possible, resulting in easy cleaning, evenly distributed torque transmission and torque dampening at start-up. Stainless steel sprockets can be supplied for belts where profiled lagging is not suitable.

Lagging

Interroll offers a wide range of profiled lagging according to the belt manufacturers' specifications.

For more detailed information, refer to p 122.

APPLICATION BASICS

Non-Belt Applications

For applications without a conveyor belt or narrow belt, covering less than 70 % of the drum motor face width, heat from the motor cannot be dissipated via the belt contact and therefore asynchronous drum motors must be optimised for applications with positive drive belts or no belts. This can also be done with a frequency inverter (see p 120). Alternatively a synchronous drum motor can be used.

Examples of non-belt applications include the following:

- Pallet roller drive and pallet transfer
- V-belt drive for driving roller conveyors
- Chain conveyors
- Narrow belts covering less than 70 % of the drum face width

Suitable drum motors

- Standard drum motors with frequency inverter
- Motors for applications with positive drive belts or no belts
- Synchronous drum motors

Non-horizontal mounting

For some non-belt applications the drum motor can be mounted in a non-horizontal position.

For more detailed information, refer to p 215.

Torque Transmission Options

Fig.: Crowned shell

Fig.: Cylindrical shell

Fig.: Frictional lagging with groove

Fig.: Profiled lagging for plastic modular belt

Fig.: PU lagging for positive drive solid homogenous belts

Fig.: Cylindrical shell with key and sprockets

Fig.: Hexagonal shell and stainless steel sprockets

Interroll Drum Motors provide a modular transmission system to suit all applications.

Whatever type of belt you plan to implement in your system, we already have the perfect drive for your application.

ENVIRONMENTAL CONDITIONS

Hygienic Conditions

For food processing and other applications where hygiene is paramount we recommend the following materials, connectors and accessories:

- Stainless steel shell
- Stainless steel or Aluminium end housings
- Stainless steel shafts
- Stainless steel labyrinths with FPM (i-series)
- PTFE / Gylon external shaft seals (D-series)
- NBR external re-greasable deflection seals (S-series)
- Food grade synthetic oil
- Hot vulcanised NBR (FDA & (EC) 1935/2004)
- Moulded PU - Shore hardness 80D ((EC) 1935/2004 only)
- Mild Steel shell can be used only with hot vulcanised NBR or moulded PU lagging (Interroll Premium Hygienic PU)
- Diamond patterned lagging is not suitable for food processing applications

Cable connectors Terminal Boxes and cables

All cable connectors, terminal boxes and cables are not included in our (EC) 1935/2004 and FDA declaration. These components are considered “Not in direct contact with food stuffs“ as described in the following regulations:

Commission regulation (EC) No. 2023/2006 of 22nd December 2006 on good manufacturing practice for materials and articles intended to come into contact with food. Article 3, definition (d): ‘non-food-contact side‘ means “the surface of the material or article that is not directly in contact with food“.

FDA Food Code 2009: Chapter 1 - Purpose and Definitions - “Food-contact surface“ means:

- (1) A surface of equipment or a utensil with which food normally comes into contact; or
- (2) A surface of equipment or a utensil from which food may drain, drip, or splash:
  - (a) Into a food, or
  - (b) onto a surface normally in contact with food.

NSF: On request
USDA & 3A: no complicance
For food processing applications, Interroll recommends using cable connectors and terminal boxes in stainless steel or technopolymer.

Hygienic Design

All Interroll Drum Motors are designed in accordance with EU Directives for Hygienic Design:

- Machinery Directive (Directive 98/37/EC) Food Machinery section, Appendix 1, point 2.1 (to be replaced by 2006/42/EC)
- Document 13 EHEDG-Guideline to the hygienic design of apparatus for open processes, prepared in collaboration with 3-A and NSF International (Only D-Series)

EHEDG designed Drum Motors

Interroll D-Series Drum Motors configured with components listed below, comply with EHEDG, Class I “Open Equipment”. They are ideally suited for ultra-hygienic environments and tolerate high water pressure wash down up to IP 69K:

- Stainless steel shell: Cylindrical or Crowned or hexagonal - Electro polished
- Stainless steel end housings
- Stainless steel extended shafts (EL-FW =25 mm)
- PTFE / Gylon shaft sealing’s
- Food grade synthetic oil

Conveyor Frame

According to EHEDG design rules, it is highly recommended to incorporate rust-free open conveyor frames to facilitate easy cleaning, wash down and disinfection of the conveyor, drum motor and belt. The hygienic mounting of the drum motor in the conveyor frame should be done in such a way that the contact between motor shaft and the frame support does not have any metal-to-metal contact, i.e. by using an elastomer sealing between shaft and frame support. The rubber material shall be FDA and EC1935/2004 compliant.

Cleaning Materials

Cleaning specialist Ecolab has certified a 5-year minimum lifetime of materials used for Interroll Drum Motor series S, i and D when exposed to typical cleaning and disinfecting procedures using Ecolab‘s Topax range of products: P3-topax 19, P3-topax 686, P3-topax 56 and P3-topactive DES.

ENVIRONMENTAL CONDITIONS

Wet and Wash Down

Wet and wash-down applications require rust-free or stainless steel materials for the drum motor shell and the sealing system.

The following materials, connectors and accessories are available:

- Shell, stainless steel or i-series mild steel with hot vulcanised lagging
- Shaft, stainless steel
- End housing for i-series, seawater resistant aluminium or solid stainless steel
- End housings for S-series, aluminium with stainless steel cover
- End housings for D-series in solid stainless steel
- Sealing for i-series, IP66 with stainless steel labyrinth with our wihtout FPM
- Sealing for S-series, IP66 NBR with regreasable stainless steel shaft cap
- Sealing for D-series, IP69k, FPM with external PTFE wiper seal
- Lagging, all types possible
- Diamond patterned lagging can be used for non-food wet applications
- Electrical connectors, all types possible

High pressure cleaning

- Max. 50 bar at a distance of 0.3 m
- Max. 60 °C water temperature for NBR regreasable sealing (S-series)
- Max. 80 °C water temperature for FPM sealing (i-series)
- Max. 80 °C / 80 bar for PTFE IP69k sealings (D-series)

Note: Changes in ambient temperature and humidity can cause condensation and lead to water inside the terminal box (especially in stainless steel). For example this can occur when the motor is operating below 5 °C and then washed down with hot water or steam. In these conditions, Interroll recommends using the cable option.

Dry and Dusty

All drum motors as standard are dust and water tight according to IP66. The D-series can also be offered with IP69k sealing. Any material can be used. However, please contact Interroll for applications in hazardous areas requiring intrinsically safe or explosive proof motors.

High Temperature

Interroll Drum Motors are normally cooled by dissipating heat through the contact between the surface of the shell and the conveyor belt. It is essential that each drum motor has an adequate thermal gradient between the internal motor and its ambient operating temperature.

All drum motors in the catalogue are designed and tested, without lagging and with a belt for use in a maximum ambient temperature of +40 °C (derated motors max. +25 °C).

- The standard maximum ambient temperature for Interroll Drum Motors is +40 °C according to EN 60034
- Any material can be used, but stainless steel has less heat dissipation
- 6, 8, 12-pole asynchronous motors produce more heat therefore the use of 2 and 4-pole motors is recommended where possible
- Lagging for positive drive belt can cause thermal overload so use motors for applications with positive drive belts or no belts or standard motors with frequency inverters optimised for temperature control. Alternatively use a synchronous motor (D-series)
- Rubber lagging for friction drive belts can also cause thermal overload
- For i-series with 6, 8, or 12 pole asynchronous motors and over 8 mm of rubber lagging standard motors with frequency inverters or motors for applications with positive drive belts or no belts should be considered. Alternatively use a synchronous motor (D-series)
- For S-series please contact your Interroll customer consultant
- External cooling systems can also be used to prevent thermal overload
- For applications with ambient temperatures over +40 °C please contact your Interroll customer consultant
- 8 & 12 pole motors may run at temperatures of +80 °C to +100 °C at the shell . This could damage certain lagging and belt materials (e.g. PU or Acetal). Please check with your lagging or belt supplier for suitability.

ENVIRONMENTAL CONDITIONS

Low Temperature

When a drum motor is operated in low temperatures (less than +5 °C), consider the viscosity of the oil and temperature of the motor while it is not running. Consider also that condensation may occur with varying temperatures. The minimum operating temperature is -25 °C

We would recommend the following materials, connectors and accessories:

- Shell, stainless steel, hot vulcanized lagging. For i-Series hot vulcanized lagging can be used with mild steel shell.
- Shaft, stainless steel
- End housing for i-series, seawater resistant aluminium or solid stainless steel
- End housings for S-series, aluminium with or without stainless steel cover
- End housings for D-series in stainless steel
- Sealing for i-series, stainless steel with labyrinth
- Sealing for S-series, regreasable shaft cap
- Use low temperature oil
- Use NBR shaft sealing below +1 °C (for i-series and D-series only)
- S- series single phase motors may have starting issues and are not recommended for use in temperatures below +5 °C
- Activate the anti-condensation heating below +1 °C (asynchronous motors only)
- The synchronous drum motor must only be used in turning or parking mode at temperatures below +1 °C
- Lagging, all types possible
- Minus temperatures reduce effectiveness of friction lagging
- Electrical connectors, all types except terminal boxes can be used
- Cables that are subject to continuous movement in minus temperatures can suffer structural damage. In such applications, special cable material, like PU, is required
- Use rust-free materials

Anti-condensation heating for asynchronous drum motors

In ambient temperatures below +1 °C, consider heating the motor windings to keep the oil viscosity, seals and internal parts at a constant temperature.

If the motor current is switched off for some time and the ambient temperature is very low, then the motor oil becomes viscous. In these conditions problems may occur when starting the motor and at temperatures of around zero frost crystals can form on the sealing surfaces causing oil leakage. To prevent these problems use anti-condensation heating.

The heating system applies a DC voltage to the motor winding, which in turn causes current to flow either in the two motor phases of a 3-phase motor or the main winding of a single-phase motor. The magnitude of the current is set by the magnitude of the voltage applied and the winding resistance. This current causes power loss in the winding which heats the motor to a temperature dependent on the ambient temperature and the magnitude of the current.

You will find information for selection of the correct voltage in the motor version tables. The values listed are average values, which can be increased or decreased depending on the required motor temperature and the ambient temperature. Interroll would strongly recommend selecting the correct voltage by testing under actual operating conditions.

Only DC voltage may be used to heat the motor. The use of AC voltage can cause the motor to move unexpectedly leading to serious damage or injury.

The stationary heating system should only be used when the motor is actually idle. The heating voltage must be switched off before the motor is operated. This can be safely done using simple relays or switches.

The suggested voltages are calculated to prevent the formation of condensation. If the motor needs to be held at a specific temperature, then the stationary heating system must be set up accordingly. In cases, such as this, please contact your Interroll customer consultant.

The anti-condensation heating voltage must be connected to any two phases of a 3-phase motor. The heating current supplied by the power supply can be calculated as follows:

Delta connection:

$$I_{DC} = \frac{V_{SHdelta} \cdot 3}{R_{Motor} \cdot 2}$$

Star connection:

$$I_{DC} = \frac{V_{SHstar}}{R_{Motor} \cdot 2}$$

Low Noise

All Interroll Drum Motors have relatively low noise and vibration levels. The performance levels are not specified or guaranteed in this catalogue because this can vary depending on the type of motor, poles, speed and application. For specific low-noise applications please contact your Interroll customer consultant.

ENVIRONMENTAL CONDITIONS

Altitude above 1,000 m

Operating a drum motor at an altitude of more than 1,000 m may result in power loss and thermal overload due to the low atmospheric pressure. This must be considered when calculating your power requirement. For further information please contact your Interroll customer consultant.

Net supply (asynchronous drum motors only)

Using 3-phase 50 Hz motors in a 60 Hz net supply with the same voltage

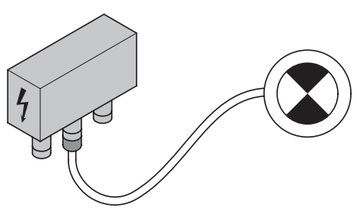
- Motor rated: 230/400 V – 3ph – 50 Hz
- Net supply: 230/400 V – 3ph – 60 Hz

Using a 3-phase 50 Hz motor in a 60 Hz net will increase the frequency and therefore the speed by 20 %. If the rated motor parameters are to be kept constant, a 20 % higher input voltage would be required (law U/f). However, if this 20 % higher voltage is not supplied all voltage-dependent parameters will be affected in accordance with the following scheme.

Net voltage = rated motor voltage

Motor data			
Power	P	kW	100 %
Rated rpm	n_n	rpm	120 %
Rated torque	M_n	Nm	88.3 %
Starting torque	M_A	Nm	64 %
Pull-up torque	M_S	Nm	64 %
Pull-out torque	M_K	Nm	64 %
Rated amperage	I_N	A	96 %
Starting amperage	I_A	A	80 %
Power factor	cos φ		106 %
Efficiency	η		99.5 %

Net supply	**Motor rating**
230/400 V	230/400 V
3 ph	3 ph
60 Hz	50 Hz



Using 3-phase 50 Hz rated motors in a 60 Hz net supply with 15/20 % higher voltage

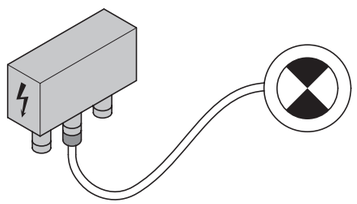
- Motor rated: 230/400 V – 3ph – 50
- Net supply: 276/480 V – 3ph – 60 – 2 and 4 poles (motor voltage + 20 %)
- Net supply: 265/460 V – 3ph – 60 – 6, 8, 10 and 12 poles (motor voltage + 15 %)

Using a 3-phase 50 Hz motor in a 60 Hz net with 20 % higher voltage will increase the frequency and therefore the speed by 20 % but will maintain all the rated motor parameters subject to small variations (law Uf). Note! However, if the net supply voltage = motor voltage +15 % the actual motor power will be 92 % of the original motor power.

Net voltage = 1.2 x rated motor voltage (for 2 and 4 poles)

Motor data			
Power	P	kW	100 %
Rated rpm	n_n	rpm	120 %
Rated torque	M_n	Nm	100 %
Starting torque	M_A	Nm	100 %
Pull-up torque	M_S	Nm	100 %
Pull-out torque	M_K	Nm	100 %
Rated amperage	I_N	A	102 %
Starting amperage	I_A	A	100 %
Power factor	cos φ		100 %
Efficiency	η		98 %

Net supply	**Motor rating**
276/480 V	230/400 V
3 ph	3 ph
60 Hz	50 Hz



INDUSTRIAL SOLUTIONS

Interroll offers a wide range of industrial solutions for its drum motors. In this chapter only the most common solutions will be explained.

General Logistics

Conveying in logistics, warehousing and storage sectors covers a wide spectrum of applications in industries, such as electronics, chemicals, food, automotive and general manufacturing. All motors in this catalogue are suitable for general logistics applications.

High performance, dynamic conveying; Smart belts, packaging machines, weighing and sorting equipment and servo belt applications

Modern Industry today expects high efficiency and increased productivity as well as fast bus communication between zones and zero maintenance. Interroll provides the perfect drive for high performance applications which typically use smart belts, packaging machines, weighing machines and sorting equipment. This type of equipment requires high torque, fast acceleration/deceleration, Dynamic braking and communication bus. If more control is needed the motor can be fitted with a feedback device to run it as a servo-drive.

Food Processing

Interroll Drum Motors are ultra-hygienic and easy to clean. All drum motors for food processing comply with EC 1935-2004 and FDA. NSF compliant motors can be ordered on request. Interroll is a member of the EHEDG (European Hygienic Engineering & Design Group).

Consider the environmental conditions before choosing drum motor versions, options and accessories.

Suitable drum motors

- For friction drive belts use a standard asynchronous drum motor
- For positive drive belts use either a motor for applications with positive drive belts or no belts or a standard asynchronous drum motor with frequency inverter
- For all applications a synchronous drum motor (D-Series) can be used

Torque transmission

- For moist or wet food applications with friction drive belts Interroll recommend rubber lagging on the drum motor to improve the friction between the belt and drum shell. In continuously wet conditions, longitudinal grooved lagging can be used to dissipate the water flow and improve the grip

Options and accessories

- Stainless steel or other materials approved for food or hygienic applications
- Drum motors for food processing are supplied with food-grade oil
- Interroll offers a variety of hot food approved (FDA/ EC 1935-2004) lagging materials
- Hot vulcanised NBR or moulded PU lagging have a longer lifespan, withstand higher torque and are easier to keep clean than cold vulcanised lagging

Conveyor Frame

According to EHEDG design rules, it is highly recommended to incorporate rust-free open conveyor frames to facilitate easy cleaning, wash down and disinfection of the conveyor, drum motor and belt. The hygienic mounting of the drum motor in the conveyor frame should be done in such a way that the contact between motor shaft and the frame support does not have any metal-to-metal contact, i.e. by using an elastomer sealing between shaft and frame support. The rubber material shall be FDA and EC1935/2004 compliant.

Cleaning Materials

Cleaning specialist Ecolab has certified a 5-year minimum lifetime of materials used for Interroll Drum Motor series S, i and D when exposed to typical cleaning and disinfecting procedures using Ecolab‘s Topax range of products: P3-topax 19, P3-topax 686, P3-topax 56 and P3-topactive DES.

INDUSTRIAL SOLUTIONS

Airport Logistics

Airport applications, such as check-in conveyors, X-Ray machines and scanning equipment, require low noise and frequent starts and stops. Most applications use friction drive belts made of PU, PVC or rubber.

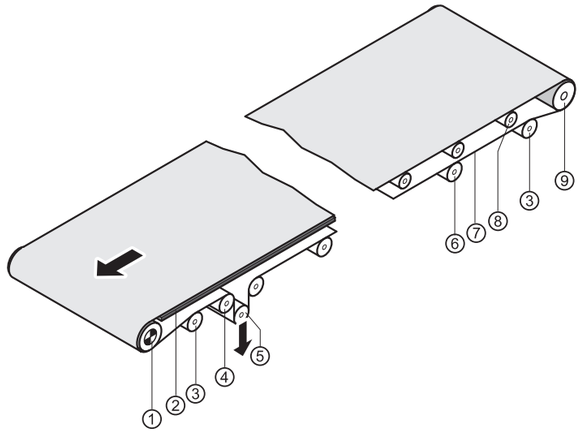
Suitable drum motors

- Standard drum motors with 4 or 6 poles offer low noise levels that are typically below 56 dB. Lower noise levels can be supplied on request
- Baggage handling systems (138i - 217i)
- X-Ray machines (113S, 113i, 138i)
- Check in conveyors (113i, 138i, 113S)
- 4-pole motors generally offer higher efficiency
- Lagging for friction drive belts to increase friction
- Backstops for inclined conveyors
- Brakes for holding the belt stationary
- Halogen-free cables available
- UL certification is available (i-series without halogen-free cables)

DESIGN GUIDELINES

A belt conveyor is designed primarily to transport or transfer materials from one place to another. In its simplest form, a belt conveyor normally consists of a longitudinal frame with a drum motor and idler pulley at each end around which a continuous belt revolves. The belt, which carries the materials, can be supported either by rollers or a steel, wood or plastic slide bed plate. In this chapter we subdivide the design guidelines into two sections: friction drive belt conveyors and positive drive belt conveyors, as each type requires a different method of torque transfer from the drive.

Friction Drive Belt Conveyors



1 Drum motor
2 Slide bed
3 Snub roller
4 Deflection roller
5 Tension roller
6 Return roller
7 Conveyor belt
8 Carrying roller
9 Idler pulley

Friction drive belt conveyors, e.g. rubber, PVC or PU flat belts, rely on high friction between the drum motor and belt and sufficient belt tension in order to transmit the torque from the drum motor to the belt. For typical friction factors, refer to the table on p 201.

Torque transmission

Normally the steel crowned shell of the drum motor is sufficient to transmit the torque but care must be taken not to over-tension the belt, which could damage the drum motor shaft bearings or even the belt itself.

Belt tension

The conveyor belt should only be tensioned in line with the manufacturer's recommendations and should be sufficient only to drive the belt and load without belt slip. Over-tensioning can damage the drum motor and belt. Maximum belt tensions for the drum motors can be found in the product pages of this catalogue.

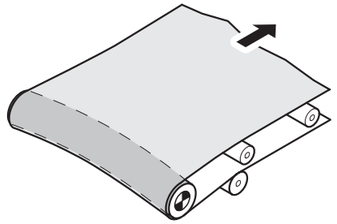


Fig.: Damaged drum motor due to over-tensioning

Rubber Lagging

To improve the torque transmitted from the drum motor to the belt, rubber lagging can be applied to the shell to produce more grip.

- Smooth lagging is adequate for dry applications or alternatively diamond patterned lagging; grooved or other lagging can also be used
- Longitudinal grooved lagging is advisable to dissipate water in food processing or wet applications
- Diamond patterned lagging can be used for non-food wet applications

When external belt tracking devices are installed, cylindrical shells can be used to prevent opposing influences.

Additional friction factor

Depending on the belt material the friction between conveyor belt and drum motor can vary.

Consider the following friction factor when calculating the belt tension:

Drum motor surface	Conditions	Belt material			
		Frictioned rubber	PVC	Polyester fabrics	Impregnation with Ropanol
Steel	Dry	0.25	0.35	0.20	0.25
	Wet	0.20	0.25	0.15	0.20
Rubber	Dry	0.30	0.40	0.25	0.30
Grooved rubber	Wet	0.25	0.30	0.20	0.25

DESIGN GUIDELINES

Belt wrap

There is another way to improve the torque transmitted from the drum motor to the belt: You can increase the angle of belt wrap around the drum motor. The angle of wrap is measured in degrees. A larger degree of wrap gives better traction between the belt and drum motor and the belt requires less belt tension. A minimum belt wrap angle of 180° is normally recommended to transmit the full torque from the drum motor to the belt, however increasing the angle of wrap to 230° and more, for instance, results in lower belt tension being required and will reduce the wear and tear on the drum motor and belt.

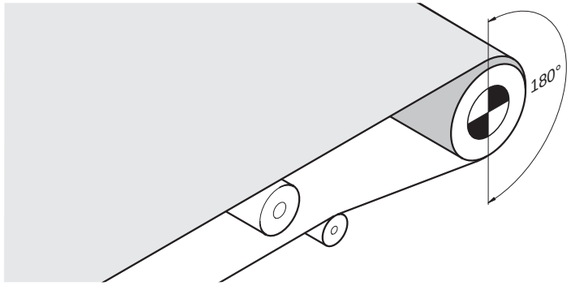


Fig.: Minimum belt wrap angle for friction drive belt conveyors

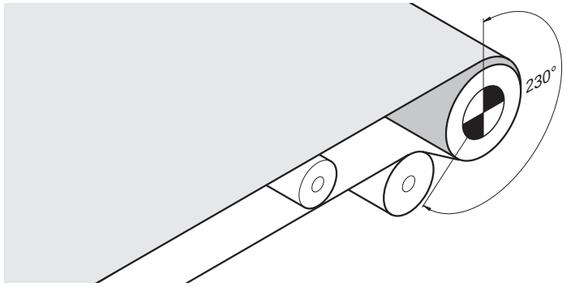


Fig.: Increased belt wrap angle for friction drive belt conveyors

Roller bed conveyors

Due to their lower friction, roller bed conveyors require less power, less belt tension and are therefore more efficient than slide bed conveyors. Roller bed belt conveyors are especially suitable for longer conveyors with heavy loads.

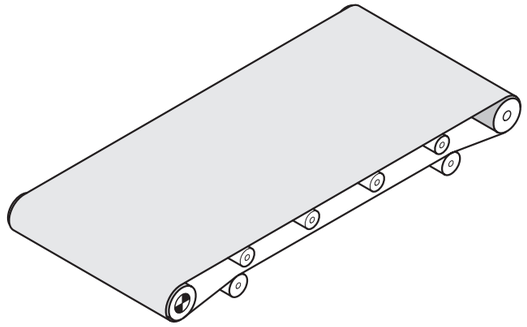


Fig.: Roller bed conveyor

Slide bed conveyors

Belt conveyors using a slide bed have more friction and require higher power and belt tension than belt conveyors with rollers and are therefore less efficient. However, the transported goods lie on the belt with greater stability and due to its simple construction is a lower cost option to the roller bed conveyor.

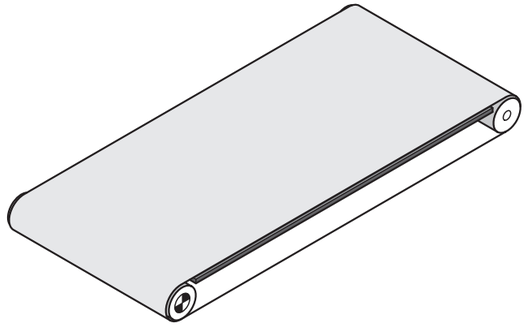


Fig.: Slide bed conveyor

DESIGN GUIDELINES

Drive positions

The drum motor is usually positioned at the head or discharge end of the conveyor but can be positioned elsewhere to suit the application or design.

Head drive

The head drive (discharge end) is the most common and preferred option for non-reversible conveyors and is ideal because it is simple to design and easy to install. Furthermore most of the belt tension is on the top carrying side and allows the drum motor to transfer its full torque to the belt.

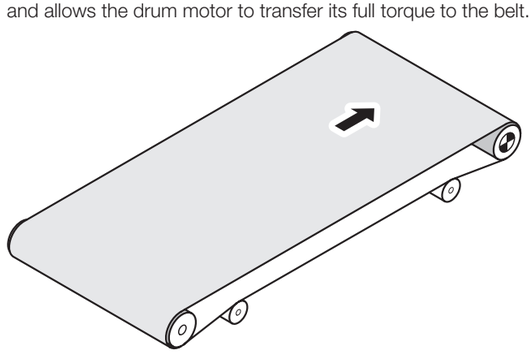


Fig.: Non-reversible conveyor with head drive

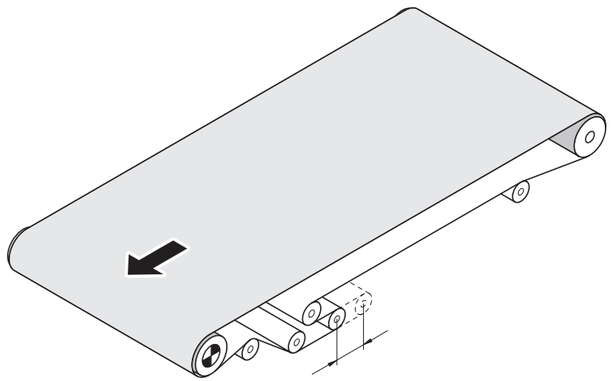


Fig.: Optional design for non-reversible long conveyor with centre take-up

Tail drive

The tail drive (loading or receiving end) is not the ideal drive position as the drum motor is pushing the top carrying side of the belt and more tension is applied to the return belt, therefore the full torque of the drive may not be applied. This type of drive can lead to belt waves (belt lifting on the top side), jumping and undesirable belt wander. If a tail drive is necessary, it is recommended only for use with short friction drive belt conveyors up to 2 or 3 metres in length with light loads. (It is not recommended for positive drive belts).

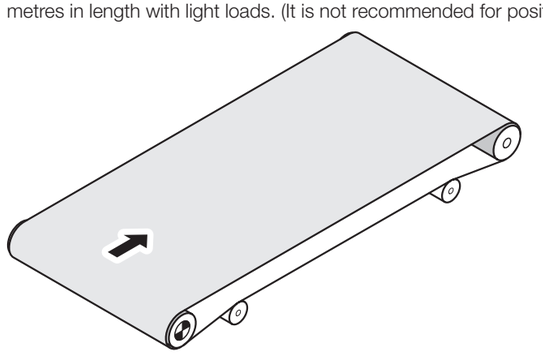


Fig.: Short friction drive belt conveyor with tail drive

Centre drive

A centre drive can be used for longer belt conveyors where a large diameter drum motor is required and there is insufficient space available at the head end. The centre drive can also be used for reversible conveyors where the belt tension is distributed more evenly between the carrying and return side of the belt. Belt tracking issues for forward and reverse operation can be minimised.

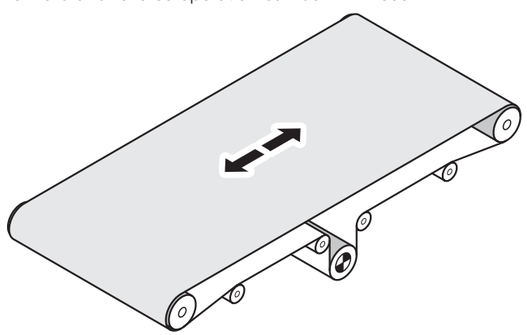


Fig.: Long belt conveyor with centre drive

DESIGN GUIDELINES

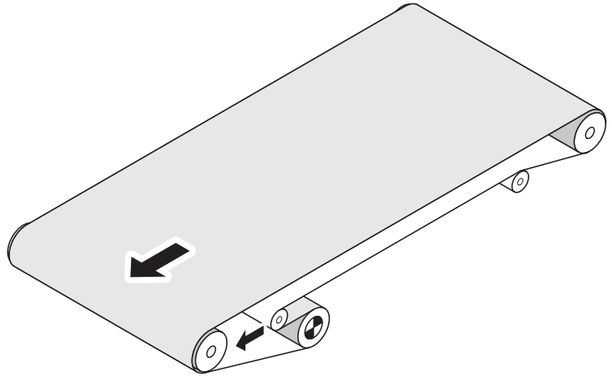
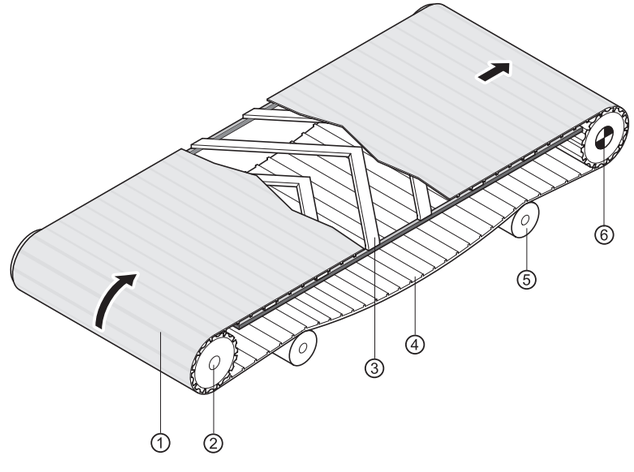


Fig.: Centre drive for long belt conveyor with increased belt wrap

Reversible drive

Interroll Drum Motors are suitable for reversing unless fitted with a backstop, although the motor control must be designed in such a way that the drum motor is brought to a complete standstill before reversing, otherwise serious damage could occur to the transmission. With drum motors fitted with a backstop, the drum motor may only be used for single direction operation, as indicated by an arrow marked on the end housing.

Positive Drive Belt Conveyors



1 Plastic modular belt
2 Idler pulley with sprockets
3 Support slats
4 Catenary sag
5 Returnway rollers
6 Drum motor

Positive drive belt systems have a lower power consumption than friction drive belts, enabling longer conveyor constructions. As there is no belt tension, there is less stress on the drum motor bearings. However, because the belt has no direct contact with the drum shell, heat dissipation is less effective and therefore must be used in conjunction with a frequency inverter optimised for this application. Alternatively motors for applications with positive drive belts or no belts can be used.

Examples of positive driven belts include the following:

- Plastic modular belts
- Positive Drive Solid Homogeneous Belts
- Steel slatted belts
- Steel mesh or wire belts
- Toothed belts
- Chain conveyors

Positive drive belt installations can be quite complex and are not discussed in detail in this catalogue. Please refer to the belt supplier's instructions and contact Interroll if further advice is required.

DESIGN GUIDELINES

Torque transmission

Drum motors for positive drive belt conveyors are normally supplied with full-width machined rubber lagging, profiled to engage the profile of the conveyor belt on the underside. Alternatively, a cylindrical drum shell with a laterally welded key can be supplied enabling any type of steel, stainless steel or plastic sprocket wheels to be fitted to the shell. The number of sprockets depends on the belt width and load but there must be a minimum of three. The calculation of the number of sprockets required can be found in the belt manufacturer's catalogue. Due to the thermal expansion of the belt, all sprockets supplied by Interroll are floating and therefore it may be necessary to guide the belt using side guides built into the conveyor frame. Alternatively, Interroll can supply one fixed sprocket positioned in the centre of the belt.

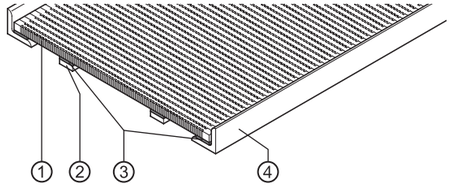


Fig.: Belt guides

1 Belt
2 Support slats
3 Wear strips
4 Side support / side guides

Belt tension

Due to its positive drive, the conveyor belt generally requires no belt tension and uses only the gravity from its own weight to engage the lagging or sprocket profile. On the return side, the belt should hang loose allowing for the so called catenary sag necessary to accommodate the changing length of the belt due to thermal expansion and contraction. The installation and conveyor design should comply with the belt manufacturer's recommendations.

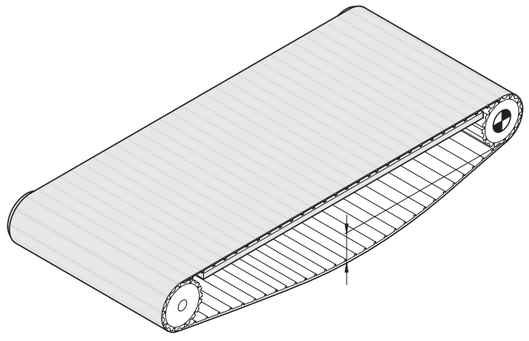


Fig.: Short conveyor without support rollers on the return belt

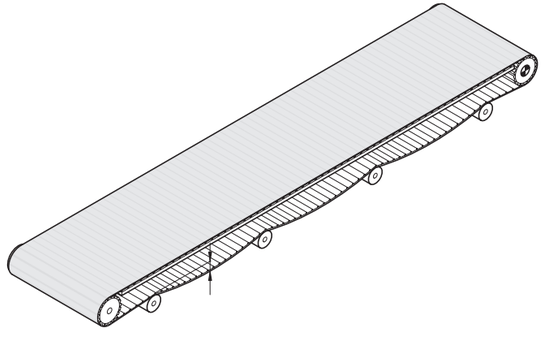


Fig.: Medium and long conveyor with catenary sags and support rollers on the return belt

Velocity factor

The increased diameter of the drum motor when fitted with lagging or sprockets will influence the rated speed of the drum motor shown in this catalogue. In order to calculate the final belt speed, please use the following calculation. The Velocity factor VF can be found in the option section p 122

$V_{belt} = V_{dm} \times VF$

V_{belt}: Speed of the belt

V_{dm}: Rated speed of the drum motor

VF: Velocity factor

The torque is transmitted directly from the shell via the lagging or through the key and sprockets and finally to the belt. This provides a very high level of efficiency of up to 97 % of the mechanical output of the motor. In start-stop applications, the use of a soft start or frequency inverter will increase the lifespan of the belt, sprockets and gear transmission.

Belt pull correction factor

When using lagging or sprockets, the rated belt pull of the drum motor will be reduced. this can be calculated as follows:

Corrected belt pull = Rated belt pull / VF

DESIGN GUIDELINES

Drive positions

For positive drive belt conveyors either a head drive or centre drive is possible.

Head drive

The drum motor should be positioned at the head (discharge end) of the conveyor so that the top carrying side of the belt is pulled under tension.

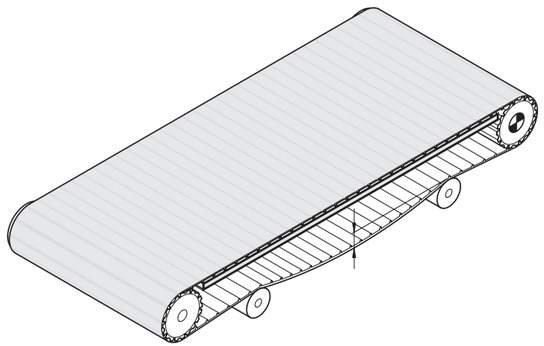


Fig.: Head drive for positive drive belt conveyors

Tail drive

Tail drives are not recommended. If the drum motor is positioned at the tail end (receiving end) and tries to push the belt, the return side of the belt will have more tension than the carrying side, causing the belt to skip and jump over the lagging profile or sprockets, causing buckling of the excess belt and interfering with product handling.

Centre drive

Centre drives can be used for long unidirectional conveyors or for reversible conveyors. In the case of reversible conveyors, great care and attention is required for their design. Please contact the belt manufacturer for advice.

Other Conveyor Types

Inclined conveyors

Inclined conveyors require more power and higher belt tension than horizontal conveyors to move the same load. A back stop should be considered for single direction inclined conveyors to prevent rollback of the belt and load.

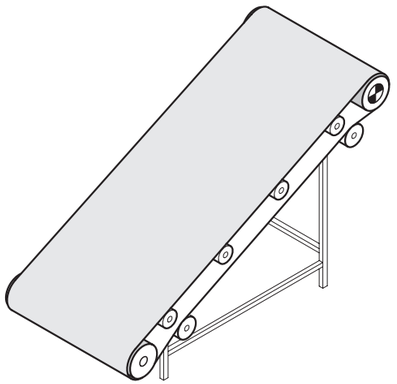


Fig.: Inclined conveyor

Reversible inclined or declined conveyors

An electromagnetic brake should be considered to prevent accidental reversal and rollback of the belt and load. To reduce acceleration and over-run of the belt and load on a declined conveyor calculate the power required as for an inclined conveyor.

Knife-edge conveyors

Knife edges reduce the gap between the transfer points of two conveyors. However, with friction drive belt conveyors, knife edges can severely increase the belt pull and tension required to overcome the increased friction between belt and knife edge. To reduce this friction the belt transfer angle should be increased as much as possible and a roller with a small diameter should replace the knife edge.

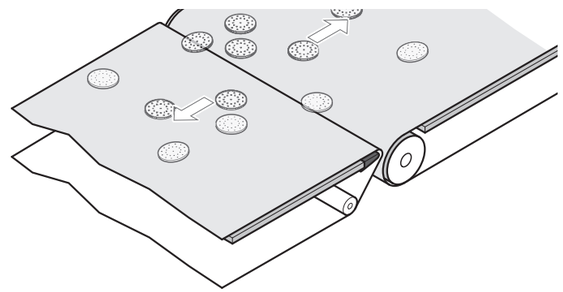


Fig.: Knife-edge conveyor

DESIGN GUIDELINES

Food processing conveyors

According to EHEDG design rules, it is highly recommended to incorporate rust-free open conveyor frames to facilitate easy cleaning, wash down and disinfection of the conveyor, drum motor and belt.

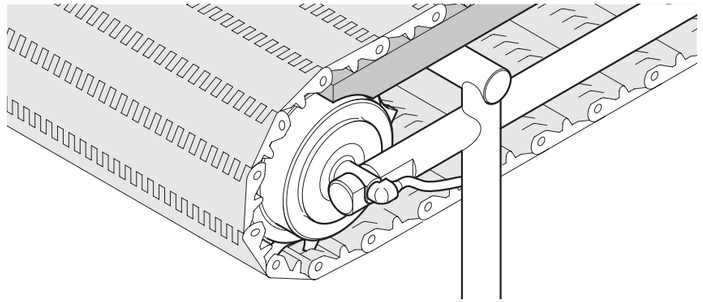


Fig.: Open conveyor design for hygienic cleaning

Plough and diverter units

If a drum motor is installed in a plough or diverter unit, the drum motor will be positioned vertically, requiring a special drum motor design with the cable always at the top (see p 215).

Frequent starts and stops

Frequent starts and stops can cause thermal overload of the motor and premature wear of the gear, reducing the lifespan of the drum motor. In applications such as these, Interroll recommends the use of a frequency inverter to optimise the heat loss of the motor and use of the soft-start ramping facility to reduce the start-up load on the gears. Synchronous or asynchronous drum motors are ideal for these applications.

Control Systems

Interroll supply brakes, backstops, feedback systems and frequency inverters for their range of drum motors.

Speed control

The drum motor and therefore the belt speed will be influenced by the load, belt tension and rubber lagging thickness. Speeds given in the product pages are based on full load and accurate to ±10 %, for more accurate speed use a frequency inverter / driver to overcome these influences. For precise speeds use a frequency inverter / driver combined with an encoder or other feedback device. Short conveyors of less than 2 or 3 metres requiring a slow belt speed using an asynchronous drum motor with 6-, 8- or 12-pole winding may result in motor thermal overload. For such applications Interroll recommend wherever possible to use 2- and 4-pole motors combined with a frequency inverter to reduce the speed. Generally, low frequencies are possible with some power loss. Frequency inverters with asynchronous motors may also be used to increase the nominal speed of the drum motor but the available torque will be reduced over frequencies of 50 Hz (see p. 243). Synchronous drum motors with a suitable frequency inverter will overcome most of these issues and can increase performance, throughput and efficiency.

For asynchronous drum motor brakes and backstops see p 134.

Merges transfers and in-feed control

For asynchronous drum motors use a frequency inverter with DC braking (with or without encoder) or alternatively an electromagnetic brake to control the merge process. Alternatively, for precise, dynamic control and/or high throughput, use a synchronous drum motor (D-Series).

Feedback system

Use an integrated encoder or other feedback device for precise speed and positioning (see p 224).

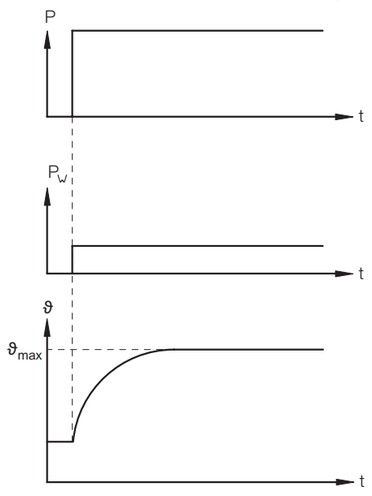
DESIGN GUIDELINES

Operating Modes

The following operating modes comply with IEC 60034-1.

Continuous running duty S1

Operation at constant load which is long enough to reach a thermal steady-state condition.



P Power input
P_W Electrical losses
ϑ Temperature
$ϑ_{max}$ Max. temperature attained
t Time

The majority of Interroll Drum Motor windings having an efficiency of over 50% are suitable for operating mode S1 and continuous running duty. Please refer to the electrical data tables for the standard motors or motors for applications with positive drive belts or no belts. The value can be found under the sign η for efficiency.

Instead of using 6-, 8-, 12-pole motors for continuous running at low speed, consider using a 4-pole motor (efficiency >50%) with a frequency inverter to obtain the required speed.

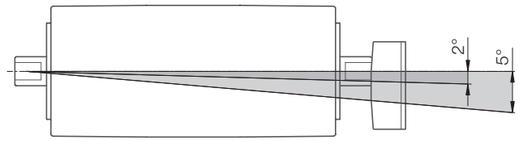
S2 to S10

For operation modes S2 to S10 consider duty cycles and consult Interroll.

Mounting Requirements

Horizontal mounting

A drum motor is normally mounted horizontally, parallel to the idler pulley and perpendicular to the conveyor frame to allow the belt to run centrally without belt wander.



All i-series, D-series and 80S drum motors must be mounted within ±5° of the horizontal. 113S drum motors must be mounted within ±2° of the horizontal.

Non-horizontal mounting

A specific drum motor design with special top bearings on the shaft is needed. The connection must always be at the top and a specific volume of oil is also needed for non-horizontal mounting.

Examples

- Carton turning
- Plough transfer units
- Deflector conveyors

DESIGN GUIDELINES

Correct orientation of drum motor shaft for horizontal mounting

The shaft of drum motors must be mounted according to the following schematic. Use the UP mark or serial number for positioning.

Type of Motor / Orientation	0°	-45°	-90°	45°	90°	180°
80i - 217i	✓	✓	✓	✓	✓	
80S/113S	✓	✓	✓	✓	✓	✓
80D/ 113D Synchronous motor	✓	✓	✓	✓	✓	✓

Mounting brackets

The mounting brackets must be strong enough to withstand the drum motor belt pull and its start-up torque. They must be fully supported and fastened to the conveyor frame so that the shaft ends do not move or deform. Shaft end key flats must always be fully supported by the brackets.

Use the mounting brackets specified for each model of drum motor (see accessories on p 144).

Axial play

The axial play between the shaft key flats and the bracket must be 1.0 mm to allow for component heat expansion.

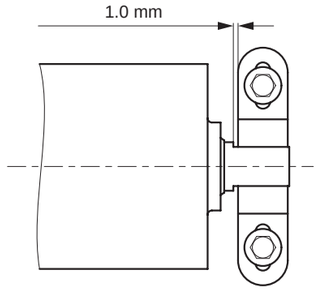


Fig.: Maximum axial play

Torsion play

The torsion play between the shaft key flats and the mounting bracket must be no more than 0.4 mm.

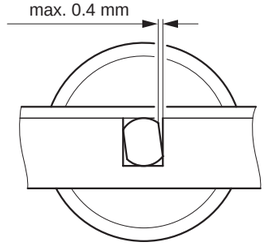


Fig.: Maximum torsion play

Supported length

There must be no clearance between the shaft key flats and mounting bracket if the drum motor is to be used for frequent reversible operations or a large number of starts and stops.

At least 80 % of the shaft key flat length must be supported by the mounting bracket (i-, D-series).

Other mounting devices

It is possible to mount the drum motor without mounting brackets directly into the conveyor frame, in which case the shaft ends have to be fitted into cut-outs in the conveyor frame that are reinforced to meet all of the above requirements.

Belt alignment

Drum motors for friction drive belts are normally supplied with crowned shells in order to ensure central belt tracking and prevent misalignment of the belt during operation. However, the belt must be checked and adjusted at its initial start up and continuously maintained as necessary.

Diagonal check

The conveyor side frames must be parallel to each other and level on both sides ensuring the drum motor fits exactly at 90degrees square to the frame. This can be checked using the following procedure:

The difference in length of the two diagonals must not be more than 0.5 %. The diagonals are measured from the drum motor shaft to the idler pulley shaft or from the belt edge to belt edge.

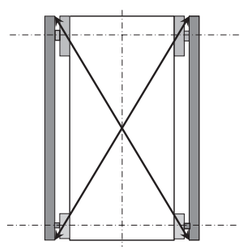


Fig.: Diagonal check

Belt position

The underside of the belt should be flush with the conveyor slide or roller bed and must not be more than 3 mm above.

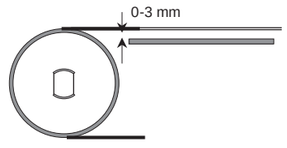


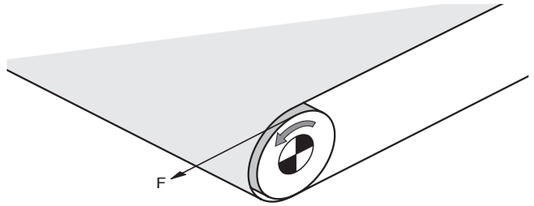
Fig.: Maximum distance between belt and conveyor bed

Misaligned drum motors, belts or idler pulleys may cause high friction and overheat the drum motor. This may also result in premature wear of the belt and lagging.

CALCULATION GUIDE AND SELECTION

Belt Pull

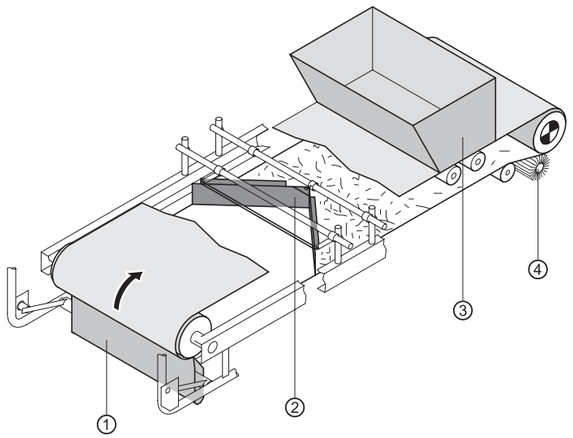
The rated belt pull, power and speed for each drum motor version are shown in this catalogue.



You can calculate the belt pull F using the following formulae. Alternatively please ask Interroll to send you their simple to use calculation program by e-mail.

Please use the formulae only as a guideline since they refer to typical operating conditions and the influence of additional friction caused by the following is not included:

- Hoppers
- Belt sealing rubbers
- Cleaning devices, such as ploughs, scrapers and brushes
- Belt tracking guides friction caused between the product and side guides

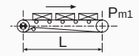
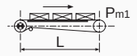
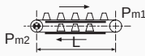
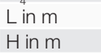


1 Scraper
2 Plough
3 Hopper
4 Brush

Belt pull calculation (F)

$F = F_0 + F_1 + F_2 + F_3$ + safety factor

Please add a safety factor of 20 % to this calculation.

Conveying system	 Roller bed conveyor	 Slide bed conveyor	 Double slide bed conveyor
 Force without load	$F_0 = 0.04 \cdot g \cdot L \cdot (2\ P_n + P_{pr})$	$F_0 = g \cdot L \cdot P_n \cdot C_2$	$F_0 = g \cdot L \cdot P_n (C_2 + C_4)$
 Force to convey materials horizontally	$F_1 = 0.04 \cdot g \cdot L \cdot P_{m1}$	$F_1 = g \cdot L \cdot P_{m1} \cdot C_2$	$F_1 = g \cdot L \cdot (P_{m1} \cdot C_2 + P_{m2} \cdot C_4)$
 Force to convey materials on incline	$F_2 = g \cdot H \cdot P_{m1}$*	$F_2 = g \cdot H \cdot P_{m1}$*	$F_2 = g \cdot H \cdot (P_{m1} - P_{m2})$*
 Accumulation	$F_3 = g \cdot L \cdot P_{m1} \cdot C_1$	$F_3 = g \cdot L \cdot P_{m1} \cdot C_1$	$F_3 = g \cdot L \cdot (P_{m1} \cdot C_1 + P_{m2} \cdot C_3)$

P_n in kg/m	Belt weight per linear metre
P_{pr} in kg/m	Weight of rotating parts of the belt conveyor (carrying and return section) per metre length
P_{m1} in kg/m	Weight of the conveyed product on the load section, for each metre of length of the belt conveyor
P_{m2} in kg/m	Weight of the conveyed product on the return section, for each metre of length of the belt conveyor
C_1	Coefficient of friction between product and belt carrying side **
C_2	Coefficient of friction between belt carrying side and slider bed **
C_3	Coefficient of friction between return belt and product **
C_4	Coefficient of friction between return belt side and slider bed **
L in m	Centre-to-centre length
H in m	Height difference in conveyor
F_0 to F_3 in N	Force components for shown operating conditions
g in m/s²	9.81

* The value of F2 is negative with declined conveyors, however to prevent over-run acceleration due to gravity, it is advised that F2 is positively calculated as for inclined conveyors.

** Please refer to p 220 for friction factors.

CALCULATION GUIDE AND SELECTION

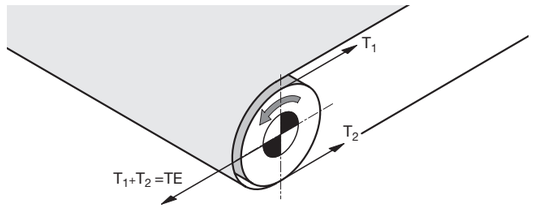
Coefficient of friction:

Belt material	Slide bed material C_2, C_4		Product material C_1, C_3		
	PE	Steel	Steel	Glass, Technopolymer	Technopolymer
PE	0.30	0.15	0.13	0.09	0.08
PP	0.15	0.26	0.32	0.19	0.17
POM	0.10	0.20	0.20	0.15	0.15
PVC/PU		0.30	0.30		0.30
Polyamide or polyester		0.18	0.18		0.17
Rubber	0.40	0.40	0.40		0.40

Belt Tension

When calculating the belt tension, the following points have to be taken into account:

- The length and width of the conveyor belt
- The belt type
- Check the belt tension required to transport the load
- Check the belt elongation necessary for the installation. Depending on the load, elongation of the belt during installation should be 0.2 to 0.5 % of the belt length.
- Belt tension and belt elongation can be obtained from the belt supplier
- Ensure, that the required belt tension does not exceed the max belt tension (TE) of the drum motor



The required belt tension T1 (top side) and T2 (bottom side) can be calculated in accordance with DIN 22101 or CEMA Standard. The actual belt tension can be roughly defined on the basis of the belt manufacturer's specifications by measuring the belt elongation during tensioning.

The maximum allowable belt tension (TE) of each drum motor is specified in the drum motor tables in this catalogue. The belt type, belt thickness and correct drum motor diameter should be in accordance with the belt manufacturer's recommendations. Too small drum motor diameters could lead to a damaged belt.

Over-tension of the belt may damage the shaft bearings or other internal components of the drum motor and will shorten the product's lifespan.

Belt elongation

Belt tension is caused by the force of the belt when it is elongated. Therefore it is very important to measure the belt elongation and to calculate the static belt tension force to avoid a damage on the drum motor. The calculated belt tension has to be equal or lower than the values specified in the drum motor tables in this cataogue.

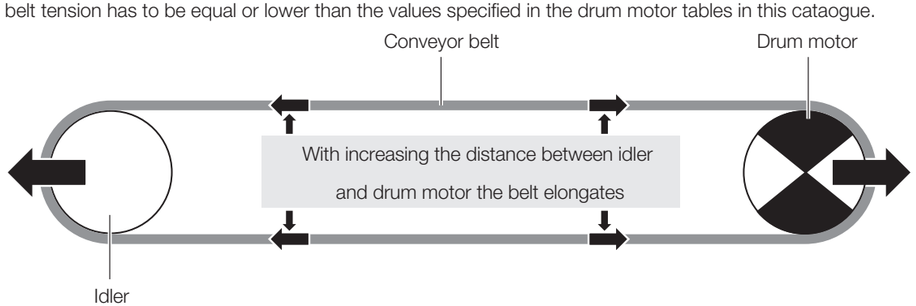


Fig.: Belt elongation

Belt elongation measurement

The belt elongation can be measured very easily with a tape measure. Mark the not-tensioned belt on two points in the belt center, where the outer diameter of the drum motor and idler is the biggest due to the crowning. Measure the distance between the two marks parallel to the belt edge (Be0). The longer the distance between the two marks, the more precise the measurement of elongation will be. Now start to tension the belt and adjust it. Once the belt is adjusted and tensioned take a measure on the two marks (Be) again. Due to the belt elongation the distance between the two marks becomes bigger.

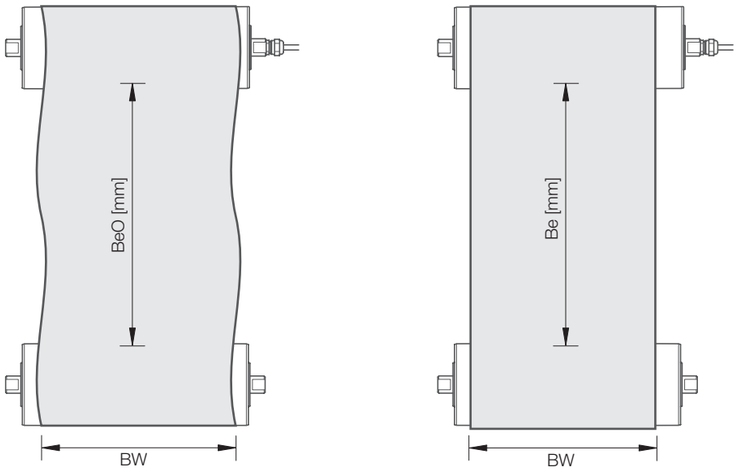


Fig.: Belt elongation measurement

CALCULATION GUIDE AND SELECTION

Belt elongation calculation

With the belt elongation measurement you can calculate the belt elongation in %.

$$B_{e\%} = \frac{B_e \cdot 100\%}{B_{e0}} - 100$$

Fig.: Formula to calculate the belt elongation in %

For the calculation of belt elongation, the following values are needed:

- Belt width in mm (BW)
- Static force per mm belt width at 1% elongation in N/mm (k1%) . This value is usually given in the belt data sheet or can be requested from the belt supplier.

$$TE_{[static]} = BW \cdot k1\% \cdot B_{e\%} \cdot 2$$

Fig.: Formula to calculate the static belt tension force in N

Load and Loading Method

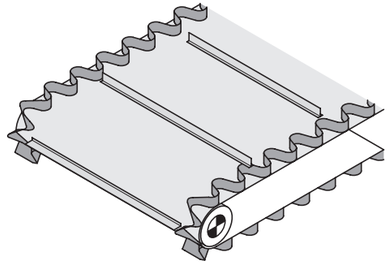
- Consider the method of loading, such as a feed conveyor, hopper loading or shock loading, and adjust the required belt pull and belt tension accordingly
- Consider the type and length of the load with regard to specific point loads and ensure that the weight of the point load (in Newtons) never exceeds the max. belt tension (TE) of the drum motor

Drum Motor Diameter

- Choose the smallest diameter but with due consideration of all the parameters of the application and environmental conditions
- Check the minimum flexing diameter allowed for the belt and choose the drum motor diameter accordingly

All belting has a safe minimum diameter for normal or back flexing for drum motors or idler pulleys. Always refer to the belt manufacturer‘s specification for this information and choose the drum motor diameter accordingly, otherwise serious damage may occur to the belt or drum motor. If the drum motor diameter is too small, insufficient torque will be transmitted to the belt and belt slip or jumping may occur.

By way of example, the belt shown below has cross cleats and side walls and requires a larger diameter of drum motor than would be required for a plain flat belt.



CALCULATION GUIDE AND SELECTION

Single Phase Asynchronous Motors

Single phase AC motors are typically used when 3-phase voltage is not available.

Principle

Single phase AC motors have a main winding and an auxiliary winding to create an auxiliary rotating field. The phase shift between the main and auxiliary phase is created by a permanently connected running capacitor.

Starting torque / Starting capacitors

The starting torque can be very limited because of the imperfect field of rotation:

- The starting torque of 3-phase AC motors is typically 120 – 410 % of rated torque
- The starting torque of single phase AC motors is typically 65 – 115 % of rated torque

Some single phase AC motors – especially in the higher power range – need an additional starting capacitor to reach a starting torque of 150 – 200 % of the rated torque. This starting capacitor should be the same size like the running capacitor and has to be switched parallel to it. This should be done ideally via a current-dependent switch relay during the start-up sequence of the motor. When the right torque/current has been reached, the starting capacitor must be switched off by the relay. The capacity value of the running capacitor is always stated on the motor type label.

Noise

Single phase motors generally have a higher noise level at zero-load operation compared to 3-phase motors, because of the difference in the rotating magnetic field. Typically there is an unbalanced increase in noise. This does not affect the operation of the drum motor and will normally disappear when belt tension or load is applied to the drum motor. Claims cannot be accepted due to this noise effect.

Capacitors and relays

All capacitors must be ordered separately for single phase drum motors. A suitable current-dependent relay to convert the starting capacitor to a run capacitor can be supplied if needed for start and run capacitors. Please contact your Interroll customer consultant for further information. The correct installation of the starting capacitor is shown on the wiring diagram supplied with the drum motor.

Interroll strongly recommends the use of 3-phase motors, as they are more efficient and save energy. Improved efficiency can be achieved by using a 3-phase motor with a frequency inverter. If a single phase supply is the only option, consider using a 3-phase motor together with a single phase input / 3-phase output frequency inverter.

Standard Interroll capacitors	Interroll Art. No.
3 µF	1100692
4 µF	1000477
6 µF	1100821
8 µF	1100724

Note: Capacitors can have different lifetime levels. Use only B rated capacitors.

Final Steps

Please conclude your selection after considering the following:

- Consider the duty cycle of the motor. When using an asynchronous drum motor for stop/starts of more than one per minute, a frequency inverter with a >= 0.5 s ramp time should be considered. Alternatively use a synchronous drum motor and frequency inverter.
- Choose the drum motor version with the required belt pull, belt tension, diameter and speed for your application
- If you cannot find the required speed in the drum motor tables then use a frequency inverter and choose the motor version with the closest speed or contact Interroll
- Choosing a drum motor version with least number of poles and / or least amount of gear stages can reduce the purchase price of the unit
- Use the drum motor configurator to validate your selection

MATERIAL SPECIFICATION

Asynchronous Motor

Tolerances
All data, excluding the rated voltage, number of poles, number of phases and physical dimensions, is subject to a tolerance of +10 % and -15 %.

Rated voltage
The motors (230 / 400 V / 50 Hz) are designed in accordance with IEC 60034-1 for using within a voltage range of ± 5 % of the rated voltage.

The motor will be supplied coupled for 3-phase / 400 V / 50 Hz connection unless otherwise specified.

Speed
All speeds stated in this catalogue are subject to a tolerance of ±10%. This depends on the temperature, load and friction factors.

Motor size
All stator windings are produced in accordance with the International Electronic Commission (IEC) DS 188 IV B1 and VDE 0530.

Motor type
Asynchronous AC squirrel cage induction motor.

Alternative voltage and frequency
- Drum motors for alternative voltages and frequencies are available on request
- S-series drum motors are normally supplied with one voltage option, either star or delta, but can be offered with delta/star connection on request
- i-series drum motors are offered with delta/star connection unless fitted with a brake or encoder whereby only one voltage is available

2-speed motors
2-speed motors can be provided to give two different output speeds. The ratio of the speeds is 1:2, due to the number of poles used. Alternatively, Interroll recommends the use of single-speed drum motors with frequency inverters to provide better power optimisation with different speeds, adjustable speed, controlled speed, ramping or soft starting.

3-phase motors
Unless otherwise specified, all motors are supplied as standard for 3-phase / 400 V / 50 Hz supply. Interroll can offer a solution: all standard voltages and standard frequencies for worldwide use.

Synchronous Motor

Tolerances
All data, excluding the rated voltage, number of poles, number of phases and physical dimensions, is subject to a tolerance of +10 % and -15 %.

All stator windings are produced in accordance with the International Electronic Commission (IEC) DS 188 IV B1 and VDE 0530.

Motor type
AC PM Synchronous Motor

Power supply
200-240 VAC; 380-440 VAC

Option
48 V DC

Thermal Protection

A thermal winding protection switch is incorporated in all Interroll Drum Motors and consists of a simple reversible bimetal switch built into the motor winding head. This must be connected externally in such a way that it will switch off the power to the motor by interrupting a relay device or a current limitation coil of an external motor protection switch. If a thermal overload occurs in the motor causing the stator winding to overheat, the switch will open at a pre-determined temperature (standard 130 °C) and interrupt the power supply. If the thermal protector is not connected, as described above, the warranty will be invalidated.

In cases where a frequency inverter is used, the thermal protection should be connected to the I/O of the frequency inverter.

Optimum protection
For optimal protection the integral thermal winding protection should be combined in a control system with an additional external thermal protection device.

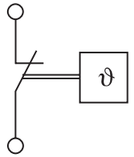


Fig.: Standard thermal/current overload protection - automatically resetting

Lifetime: 10,000 cycles			
AC	cos = 1	2.5 A	250 V AC
	cos = 0.6	1.6 A	250 V AC
DC	cos = 1	1.6 A	24 V DC
	cos = 0.6	1.25 A	48 V DC

Lifetime: 2,000 cycles			
AC	cos = 1	6.3 A	250 V AC
Back setting temperature		40 K ± 15 K	
Resistance		< 50 mΩ	
Contact bounce time		< 1 ms	

MATERIAL SPECIFICATION

Shell

Manufactured from thick-walled mild steel tube and machine crowned to ensure correct belt tracking. Alternatively, the tube can be made of stainless steel (AISI 304). The stainless steel version has extended chemical resistance and is suitable for food applications.

Shells with special crowns and grooves are used for multiple belt conveyors.

Material	Standards	Material number	Short name
Mild steel	EN 10027	1.0037	S235 JR
Stainless steel	EN 10027	1.4301 / 1.4307	X5CrNi18-10

Surface roughness

The shells of Interroll D- and i-series motors are normally supplied with standard roughness, but also the following versions can be supplied:

- Standard roughness: R_z 20 µm (R_a 3.2 µm)
- Fine turned roughness: < R_z6.3 µm (R_a 0.8 µm)
- Electro polished: < R_z1.6 µm (R_a 0.2 µm)

End Housing

Interroll Drum Motors are supplied with pressed and glued end housings. End housings are manufactured from sea water-resistant aluminium but can also be supplied in stainless steel.

Interroll offers the following versions of end housings:

- Standard
- With V-grooves
- With O-grooves
- With chain sprockets

Material	Standards	Material number	Short name
Mild steel	EN 10027	1.0037	S235 JR
Stainless steel	EN 10027	1.4305	X8CrNiS18-9
Aluminium	EN 10027	3.2385	D-AlSi10Mg

Shaft

Front and rear shafts are manufactured from mild steel or stainless steel (AISI 304) and have identical shaft diameters and shaft flats at both ends.

Interroll offers the following versions of shafts:

- Standard
- Cross-drilled thread

Material	Standards	Material number	Short name
Mild steel	EN 10027	1.0037	S235 JR
Stainless steel	EN 10027	1.4305	X8CrNiS18-9

MATERIAL SPECIFICATION

Sealing System

All internal parts are fully protected by a double-lipped seal (FPM or NBR) fitted in both end housings.

i-Series i-series drum motors are fitted with external labyrinth seal and hardened ground sleeves under the shaft seals to increase performance and lifetime.

S-Series S-series drum motors are fitted with external deflection seals made from NBR.

D-Series D-series drum motors are fitted with external deflection seals made from PTFE.

External Labyrinths

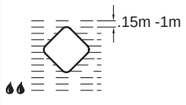
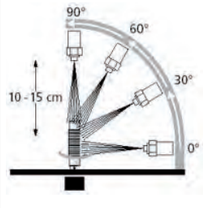
Labyrinth seal material	Standards	Material number	Short name
Mild steel, zinc-plated	EN 10027	1.0037	S235 JR
Stainless steel	EN 10027	1.4301	X5CrNi18-10

Protection rate Interroll Drum Motors are provided with IP66 protection as standard. IP69k is available for D-Series.

Protection against solid bodies

Symbol	IP, first number	Definition
	5	Dust-protected
	6	Dust-tight

Protection of internal equipment against harmful ingress of water

Symbol	IP, second number	Definition
	4	Protected against spray water
	5	Protected against water jets (P1 nozzle 6.3 mm, water delivery rate 12.5 l/min ±5 %)
	6	Protected from projections of water similar to marine swells (P2 nozzle 12.5 mm, water delivery rate 100 l/min ±5 %)
	7	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed 1 in water under standardised conditions of pressure and time.
	9k	Protected against the effects of high-pressure liquids • Test with fan nozzle • Test unit on turntable (5revolutions / minute • Spray quantity 14to 16l/min • Water pressure about 8,000 to 10,000 kPa at 80±5 °C with a duration of 30 s per position • Water aimed at the housing with increased pressure from each direction must not have any damaging effect.

MATERIAL SPECIFICATION

Electrical Connectors

Material specification for terminal boxes and straight and elbow connectors.

The motor is connected through a hollow shaft to a terminal box or cable connector with at least 1 m of external cable. Straight and elbow cable connectors are available.

Condensation in terminal box

In conditions where there are varying ambient temperatures of between e.g. -5 to +40 °C, condensation may form inside the terminal box. In conditions such as these, it is advisable to use cables with straight or elbow connectors.

Straight and elbow connectors

Material	Standards	Material number	Short name
Stainless steel	EN 10027	1.4305	X8CrNiS18-9
Brass/Nickel	EN 10027	2.0401	CuZn39Pb3
Technopolymer	ISO 1043	SK605 NC10	Crastin Polybutylenterephthalat

Terminal box

Material	Standards	Material number	Short name
Stainless steel	EN 10027	1.4305	X8CrNiS18-9
Aluminium	EN 10027	3.2385	CuZn39Pb3
Technopolymer	ISO 1874	PA 6, MHR, 14-090, GF30	Grilon BG-30 S

Shell Lagging

NBR

This type of synthetic rubber has good wear characteristics, excellent resistance to oil, fuel, and other chemicals and is also easy to clean. Its resilience makes NBR the perfect material for the rubber lagging of drum shells. It can be used in most material handling applications. NBR withstands temperatures from -40 to +120 °C, Nitrile rubber is generally resistant to aliphatic hydrocarbons but, like natural rubber, can be attacked by ozone, aromatic hydrocarbons, ketones, esters and aldehydes. White NBR is accepted for the food processing industry and is offered with FDA and EC1935/2004 approval.

PU

PU represents any polymer consisting of a chain of organic units joined by urethane (carbonate) links. It is tear-resistant and is superior to rubber. Polyurethane has outstanding resistance to oxygen, ozone, sunlight and general weather conditions. Most formulations offer an extremely long lifespan, good resistance to heat and cold at temperatures of between -35 and +80 °C and is offered with EC1935/2004 approval.

Note: Minimum PU thickness 4 mm, maximum shell length (SL) 1,200 mm.

Hot vulcanisation

Hot vulcanised NBR rubber lagging can be used to increase friction between the drum motor and belt for high torque applications and to reduce belt slip. Alternatively it can be profiled to drive modular belts and other special applications. Due to the high temperature of the process, the lagging must be applied to the shell before the drum motors are assembled. The result is a very strong bonded rubber, suitable for high torque applications and completely sealed to the shell. This method has long-life characteristics and is recommended for hygienic applications.

Note: NBR profiled lagging is not recommended to drive solid homogeneous belts due to the high friction which can cause the belt to jump.

Cold vulcanisation

Cold vulcanised NBR rubber lagging is used to increase the friction between the drum and belt in order to reduce belt slip. The cold process requires a special adhesive (cement) to glue the lagging onto the drum shell. It has a shorter lifespan than hot vulcanisation when used in high torque applications. Cold vulcanised white NBR material is FDA approved but is not ideal for food or hygienic applications, due to the glue and lagging joint that could harbour bacteria. The lagging follows the original shape of the drum shell (crowned or cylindrical) and is not machined afterwards. However, the process can be applied quickly to finished assembled drum motors and therefore is a quick and easy solution.

PU moulding

PU material is moulded or cast using a 2-part chemical process to produce lagging for the drum shells or sprockets to drive modular belts. The PU moulded shell or sprocket is then placed in an oven to stabilise the chemical reaction and obtain the final mechanical characteristics and hardness required. This process must be applied to the shell before the drum motor is assembled. Moulded PU lagging can be offered with low friction suitable for driving positive drive solid homogeneous belts.

Approvals and Certifications

Interroll Drum Motors can be offered certified and approved to UL 1004 for the North American market and cUL for the Canadian market.

NSF Certification is available on request only. All drum motors can be supplied with CSA (Canadian Standard Association) specification. If requested, a certificate of approval can be supplied with each drum motor at extra cost.

Interroll Drum Motors for food industry comply to EHEDG and materials comply with FDA, EC1935/2004 and Ecolab. Cleaning specialist Ecolab has certified a 5-year minimum lifetime of materials used for the Interroll Drum Motors of the S-series, i-series and D-series when exposed to typical cleaning and disinfecting procedures using Ecolab‘s Topax range of products: P3-topax 19, P3-topax 686, P3-topax 56 and P3-topactive DES.

CABLES

i- and D-series

A choice of straight and elbow connectors for the following cables (including optional terminal boxes) are shown in each of the product pages, which cover most standard applications.

For D-series only screened cables are available.

A screened cable must be chosen when connecting to a frequency inverter to reduce EMC emissions.

Cables for i- and D-series

Reference number	**1002056**	**1002057**	**1002058**	**1002059**	**1002060***	**1002061**	**1002062**	**1004272***	**1004273***	**1101411***
Main core (quantity)	7	7	7	7	4	7	7	4	7	4
Cross section mm²	0.75	0.75	0.75	0.75	0.75	0.50	0.50	0.50	1.50	1.50
Numeric code or colour code	numeric code	numeric code	numeric code	numeric code	numeric code	numeric code	numeric code	numeric code	numeric code	numeric code
Insulation conductors (main core)	PVC	PVC	PP	PP	ETFE	ETFE	ETFE	ETFE	PVC	PVC
Data core (quantity)	2	2	2	2	2	2	2	2	2	2
Cross section mm²	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Numeric code or colour code	colour code	colour code	colour code	colour code	colour code	colour code	colour code	colour code	colour code	colour code
Insulation conductors (data core)	PVC	PVC	PP	PP	ETFE	ETFE	ETFE	ETFE	PVC	PVC
Insulation outer sheath	PVC	PVC	PUR	PUR	PVC	PVC	PVC	PUR	PVC	PVC
Halogen- free	no	no	yes	yes	no	no	no	yes	no	no
Colour outer sheath	black	orange	black	orange	orange	black	orange	orange	orange	orange
Screened (copper / steel)	–	copper	–	copper	copper	–	copper	copper	copper	copper
Outside diameter mm	9.20 ±0.3	9.98 ±0.3	9.20 ±0.3	9.80 ±0.3	7.10 ±0.3	6.80 ±0.3	7.60 ±0.3	7.80 ±0.2	10.20 ±0.3	9.30 ±0.3
Operating voltage 300 / 600 V	600	600	600	600	600	600	600	600	600	600
Temperature range °C	-20 to +105 acc. UL	-20 to +105 acc. UL	-20 to +80	-20 to +80	-20 to +105 acc. UL	-20 to +105 acc. UL	-20 to +105 acc. UL	-20 to +80	-20 to +105 acc. UL	-20 to +105 acc. UL
Approval	cULus	cULus			cULus	cULus	cULus		cULus	cULus

* For i- and D-Series

	SKF 32 or 48 incremental encoder cable	**RLS incremental encoder cable**	**LTN Resolver cable**	**SKS 36 hiperface (Sick Stegman)**
Reference number	**1004269**	**-**	**1003526**	**1004274**
Main core (quantity)	4	8	6	8
Cross section mm²	0.14	0.14	0.14	0.15
Numeric code or colour code	colour code	colour code	colour code	colour code
Insulation conductors (data core)	PVC	PVC	PVC	PP
Insulation outer sheath	PVC	PVC	PVC	PUR
Halogen- free	no		no	yes
Colour outer sheath	grey	grey	grey	black
Screened (copper / steel)	copper	copper	copper	copper
Outside diameter mm	4.30 ±0.3	5.00 ±0.2	5.80 ±0.3	5.30 ±0.3
Operating voltage max.V	250	-524	350	250
Temperature range °C	-20 to +105 acc. UL	-20 to +105 acc. UL	-20 to +80 acc. UL	-20 to +80 acc. UL
Approval	None	None	None	None

CABLES

S-series

A choice of straight and elbow connectors for the following cables (including optional terminal boxes) are shown in each of the product pages, which cover most standard applications.

Choose a screened cable when connecting to a frequency inverter to reduce EMC emissions.

Cables for S-series

PUR or external screened cables may not be suitable for some food processing installations. For such applications an optional blue cable protection cover can be ordered. The cover provides protection against UV light and cleaning agents. When ordering the external blue cover please chose a cable gland from the product pages.

Reference number	**1000583**	**1000584**	**1000595**	**1000569**	**1000577**
Main core (quantity)	9	6	6	7	6
Cross section mm²	0.75	0.75	0.75	0.75	0.75
Numeric code or colour code	numeric code + colour code	colour code	colour code	numeric code + colour code	colour code
Insulation conductors (main core)	PVC	PVC	PP	PVC	PP
Data core (quantity)	–	–	–	–	–
Insulation outer sheath	PVC	PVC	PUR	PVC	PUR
Halogen- free	no	no	yes	no	yes
Colour of outer sheath	black	black	grey	black	grey
Screened (copper / steel)	–	–	–	–	copper
Outside diameter mm	7.30	7.15	7.15	7.15	7.15
Operating voltage V	460/800	460/800	450/750	300/500	460/800
Operating voltage acc. to UL V	300/500	300/500	340/600	300/500	300/500
Temperature range °C	-40 to +105 -40 to +80 (UL)	-40 to +105 -40 to +80 (UL)	-40 to +90 -40 to +80 (UL)	-40 to +105 -40 to +80 (UL)	-40 to +105 -40 to +80 (UL)
Approval	cULus	cULus	cULus	cULus	cULus

OIL

All drum motors are supplied with oil adequate for the drive. Mineral, synthetic, food-grade and low temperature oil is available. Food-grade oil is FDA approved and the ISO viscosity classes are according to ISO 3498-1979.

Drum motor	Oil type	Ambient temperature	Viscosity	Reference number
80S	Mineral	+10 to +40 °C	ISO VG 68	1001783
	Food-grade, synthetic	+10 to +40 °C	ISO VG 68	1001777
80S, 3-phase motor	Low temperature, food-grade, synthetic	-25 to +20 °C	ISO VG 15	1001784
113S	Mineral	0 to +40 °C	ISO VG 32	1001782
	Food-grade, synthetic	0 to +40 °C	ISO VG 32	1001785
	Low temperature, food-grade, synthetic	-25 to +20 °C	ISO VG 15	1001784
80i	Mineral	+10 to +40 °C	ISO VG 68	1001783
	Low temperature, food-grade, synthetic	-20 to +40 °C	ISO VG 68	1001777
80i with brake	Low temperature, food-grade, synthetic	-10 to +40 °C	ISO VG 68	1001777
113i to 217i	Mineral	+5 to +40 °C	ISO VG 150	1001314
	Low temperature, food-grade, synthetic	-25 to +40 °C	ISO VG 150	1001776
113i to 217i with brake	Mineral	+10 to +40 °C	ISO VG 150	1001314
	Food-grade, synthetic	+10 to +40 °C	ISO VG 150	1001776
	Low temperature, food-grade, synthetic	-10 to +15 °C	ISO VG 68	1001777
80D & 113D	Food-grade, synthetic	-25 to +40 °C	ISO VG 150	1001776
80D & 113D	Food-grade, synthetic	+10 to +40 °C	ISO VG 150	1001776

Note: For temperatures below +1 °C Interroll recommends applying an anti-condensation DC voltage to the winding to prevent damage to the seals, starting issues or brake malfunction. Please refer to the motor version tables for correct DC voltage.

Note: Drum motors with electromagnetic brakes used in temperatures under+10 °C must be filled with ISO VG 68 synthetic oil.

Food-grade, synthetic oil for hygienic applications is according to:

- FDA
- NSF International (categories H1, HT-1 and 3H)
- ISO 21469:2006
- EN 1672/2 (1997) and EC 389/89 (1989)
- Halal – Kosher

CONNECTION DIAGRAMS

Abbreviations

Explanation of abbreviations:

TC: Thermal control	FC: Frequency inverter	Tr: Transformation ratio
BR: Brake Option	3~: 3-phase motor	Cr: Capacitor run
NC: not connected	1~: 1-phase motor	Cs: Capacitor start
rd: red	gy: grey	wh: white
ye: yellow	gn: green	or: orange
bu: blue	bn: brown	vi: violet
bk: black	pk: pink	( ): alternative colour

Rotation

Note: The rotational direction of the drum motor is shown on the connection diagrams. The rotation indicated is correct when looking at the drum motor from the connection side.

Cable connections

Connection Diagrams for Interroll Drum Motors 80S, 113S

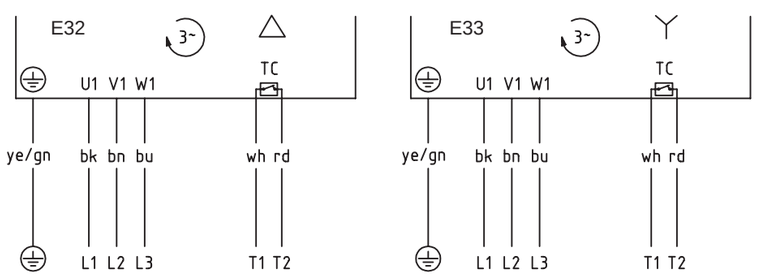


Fig.: 1-phase operation, 7 lead cable

Note: *Further information for starting relay, see p 224

Fig.: 3-phase operation, 6 lead cable, winding for 1 voltage, delta or star connection (internally connected)

Delta connection: Low voltage Star connection: High voltage

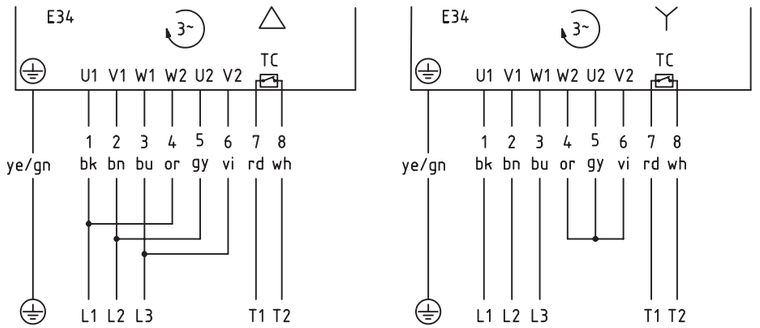


Fig.: 3-phase operation, 9 lead cable, winding for 2 voltages, delta or star connection

Delta connection: Low voltage Star connection: High voltage

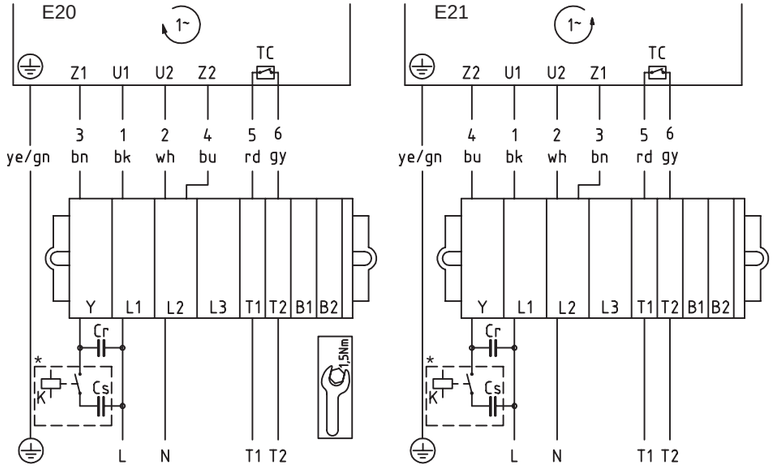


Fig.: 1-phase operation, 7 lead cable

Note: *Further information for starting relay, see p 224.

The screws of the terminal box lid have to be tightened with a torque of 1.5 Nm.

Terminal box

CONNECTION DIAGRAMS

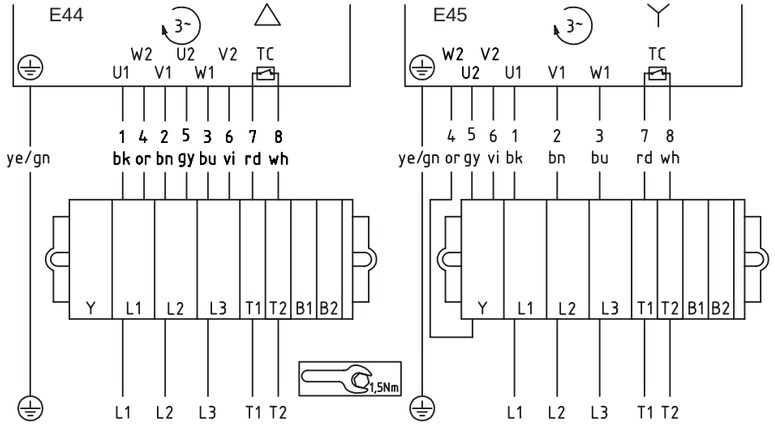


Fig.: 3-phase operation, 9 lead cable, winding for 2 voltages, delta or star connection
Note: The screws of the terminal box lid have to be tightened with a torque of 1.5 Nm.

Delta connection: Low voltage Star connection: High voltage

Cable connections

Connection Diagrams for Interroll Drum Motors 80i, 113i, 138i, 165i, 217i

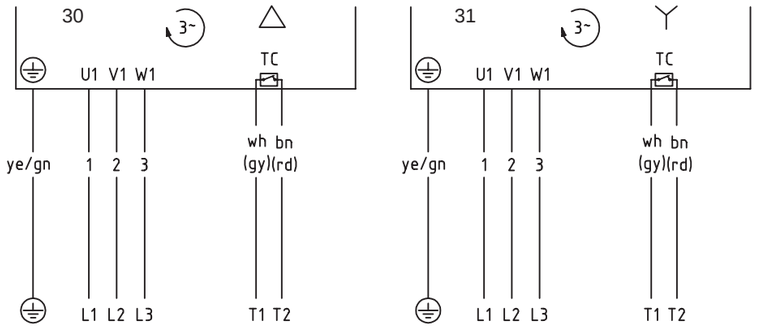


Fig.: 3-phase operation, 4+2 lead cable, winding for 1 voltage, delta or star connection (internally connected)

Delta connection: Low voltage Star connection: High voltage

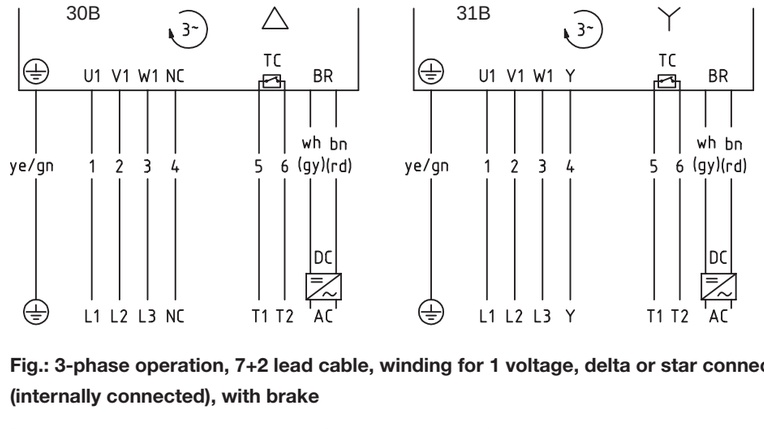


Fig.: 3-phase operation, 7+2 lead cable, winding for 1 voltage, delta or star connection (internally connected), with brake

Delta connection: Low voltage Star connection: High voltage

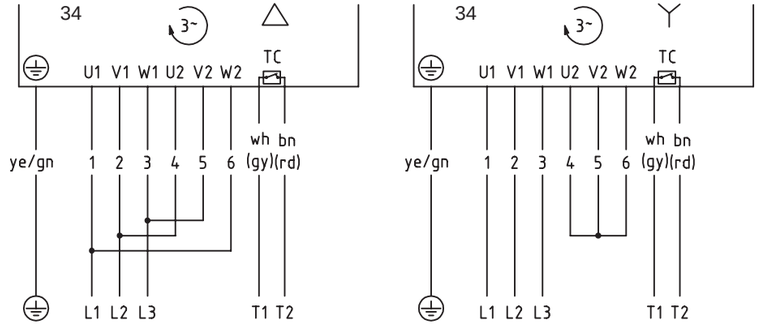


Fig.: 3-phase operation, 7+2 lead cable, winding for 2 voltages, delta or star connection

Delta connection: Low voltage Star connection: High voltage

CONNECTION DIAGRAMS

Terminal box

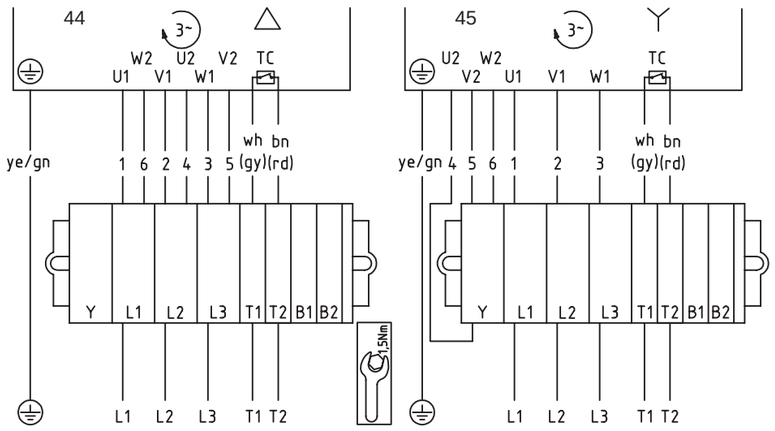


Fig.: 3-phase operation, winding for 2 voltages, delta or star connection
Note: The screws of the terminal box lid have to be tightened with a torque of 1.5 Nm.

Delta connection: Low voltage Star connection: High voltage

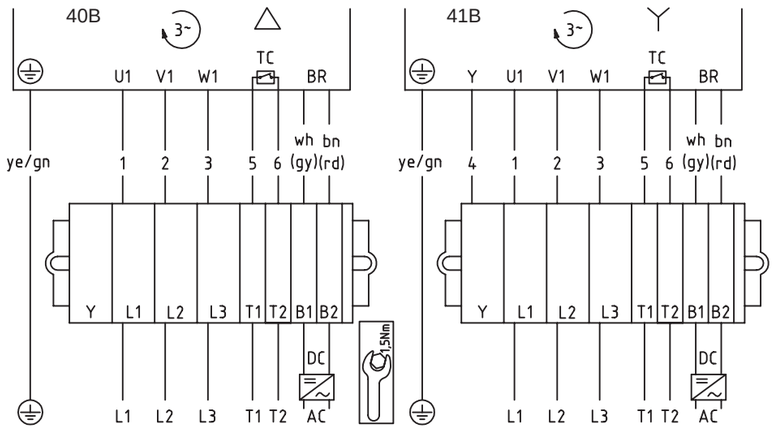


Fig.: 3-phase operation, winding for 1 voltage, delta or star connection, with brake (internally connected)
Note: The screws of the terminal box lid have to be tightened with a torque of 1.5 Nm.

Delta connection: Low voltage Star connection: High voltage

Connection Diagrams for Synchronous Drum Motors (D-Series)

(L1, L2, L3have to be connected to output U, V, W of the inverter.)

Cable connections

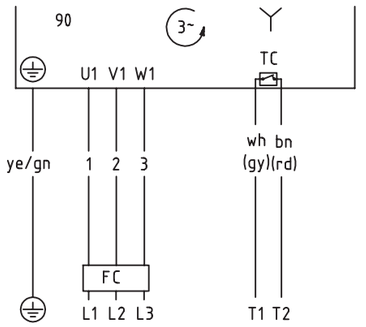


Fig.: Motor + TC

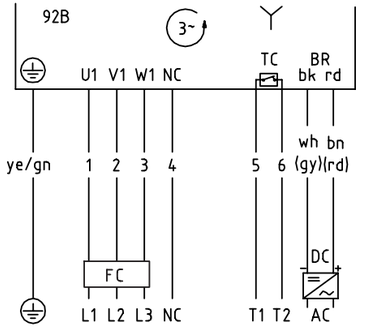


Fig.: Motor + TC + Brake

CONNECTION DIAGRAMS

Connection Diagrams for Feedback Devices

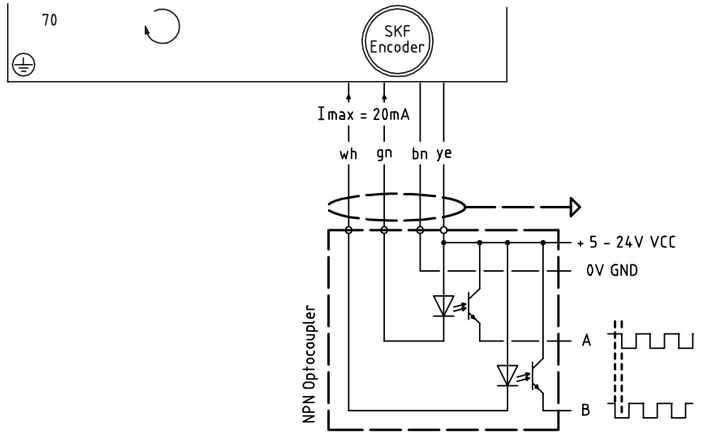


Fig.: SKF 32/48 incremental encoder

Note: Interroll recommends the use of optocouplers.

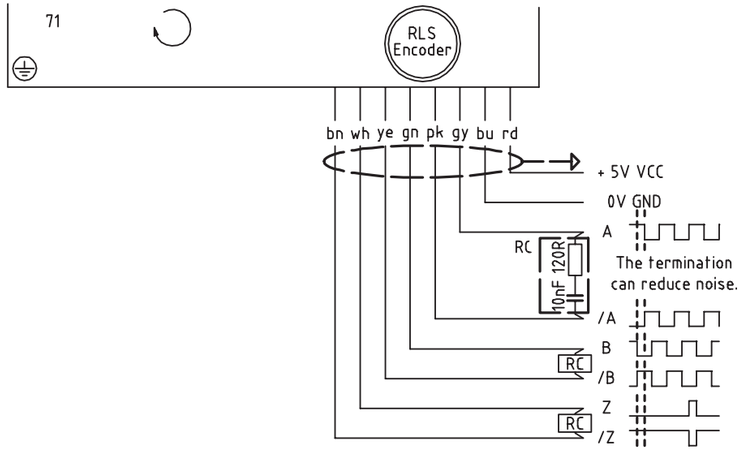


Fig.: RLS incremental encoder

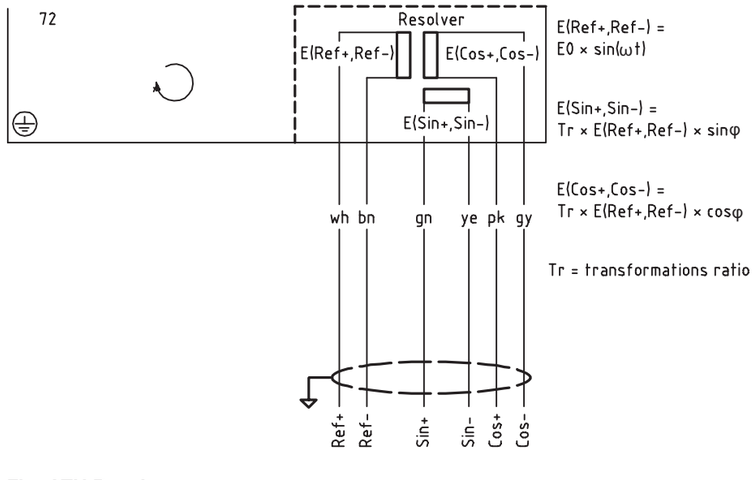


Fig.: LTN Resolver

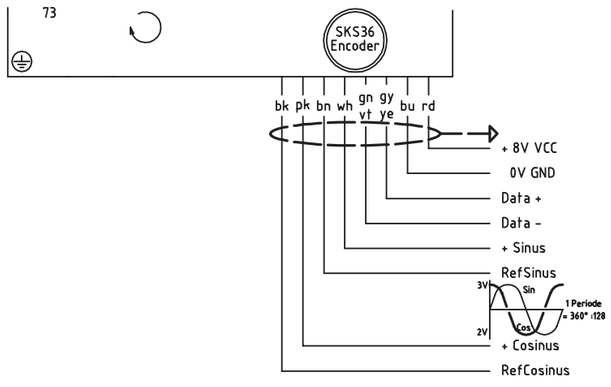


Fig.: SKS36 Hiperface

Note: For SKS36 hiperface (Sick/Stegman), please contact your Interroll customer consultant

CONFIGURATOR ACCESSORIES

Mounting Brackets

Anti-vibration brackets		**see p 146**
80S, 113S only	Quantity, ref. no.:	___, _____
	Quantity, ref. no.:	___, _____
Light-duty flanged bracket for drum motor		see p 148
80S, 113S only	Quantity, ref. no.:	___, _____
	Quantity, ref. no.:	___, _____
Light-duty flanged bracket for idler pulley		see p 150
80S, 113S only	Quantity, ref. no.:	___, _____
	Quantity, ref. no.:	___, _____
Heavy-duty flanged bracket, Aluminium		see p 152
80i, 113i, 138i, 165i drum motors and idler pulleys	Quantity, ref. no.:	___, _____
	Quantity, ref. no.:	___, _____
Heavy-duty flanged bracket, PE		see p 156
80i, 113i, 138i, 165i drum motors and idler pulleys	Quantity, ref. no.:	___, _____
	Quantity, ref. no.:	___, _____
Plummer block for i-series drum motors and idler		see p 160
80i, 113i, 138i, 165i, 217i drum motors and idler pulleys	Quantity, ref. no.:	___, _____
	Quantity, ref. no.:	___, _____
Plummer block for D-series drum motors and idler		see p 160
80D, 113D drum motors and idler pulleys	Quantity, ref. no.:	___, _____
	Quantity, ref. no.:	___, _____

Idler Pulleys for S- and i-series

Idler pulley with integral bearing			**see p 162**			
Quantity	_____					
Shell lagging	❍ Same as drum motor		❍ None			
Shell	❍ Crowned		❍ Cylindrical		❍ Cylindrical with key	
	❍ Mild steel		❍ Stainless steel			
End housing	❍ With V-grooves		❍ With O-grooves		❍ With chain sprockets	
	❍ Aluminium		❍ Stainless steel			
Shaft	❍ Mild steel		❍ Stainless steel		❍ Cross-drilled thread	
Shaft cap S-series	❍ Aluminium		❍ With cable protection		❍ Regreasable, stainless steel	
External seal i-series	❍ Mild steel, galvanised labyrinth		❍ Stainless steel labyrinth		❍ Stainless steel labyrinth with FPM	

Idler pulley without bearings Series 7000		**see p 168**	
	Quantity, ref. no.:	___, _____	RL: _____
Idler pulley with bearings Series 7000		see p 170	
	Quantity, ref. no.:	___, _____	RL: _____

Idler Pulleys for D-Series

Idler Pulley with integral bearing			**see p 162**					
Quantity	_____							
Shell lagging	❍ Same as drum motor		❍ None					
Shell	❍ Crowned		❍ Cylindrical		❍ Cylindrical with key		❍ Hexagonal 88	
	❍ Mild steel		❍ Stainless steel					
End housing	❍ Stainless steel							
Shaft	❍ Stainless steel							
External seal	❍ Deflection seal PTFE							

Conveyor Rollers

Conveyor Roller Series 1450	**see p 172**	
Quantity, ref. no.:	___, _____	RL: _____
Universal Conveyor Roller Series 1700	see p 174	
Quantity, ref. no.:	___, _____	RL: _____

CONFIGURATOR S-SERIES

Drum Motor

Required delivery time	___ /___ /____		**Company** _____	
Contact and Reference	_____			
Quantity	_____			
Application	❍ Friction drive belt	❍ Positive drive belt / No belt	❍ Type of industry:_____	
	❍ Dry	❍ Wet ❍ Washdown	❍ Ambient temperature: _____°C	
Mounting	❍ 80S: Horizontal (max ± 5°)	❍ 113S: Horizontal (max ± 2°)	❍ Other angle of mounting:_____	
Motor Data:				
Motor type	❍ 80S ❍ 113S			
Rated power	_____ kW			
Number of poles	_____			
Rated speed	_____ m/s at 50 Hz	❍ Variable speed: from _____ to _____ m/s at 50 Hz		
Gear ratio	_____			
Rated voltage	❍ 230 V ❍ 400 V	❍ Other: _____ V ❍ 1-phase	❍ 3-phase	
Frequency	❍ 50 Hz ❍ 60 Hz			
Versions:				
Length (full mm only)	SL: _____ mm	EL: _____ mm	AGL: _____ mm	
Shell profile	❍ Crowned	❍ Cylindrical	❍ Cylindrical with key	
Shell material	❍ Mild steel	❍ Stainless steel		
End housing	❍ Aluminium	❍ Stainless steel		
Shaft cap	❍ Aluminium (standard)	❍ Aluminium with cable protection	❍ Stainless steel, regreasable	
Cable connector	❍ Straight, stainless steel	❍ Elbow, stainless steel		
	❍ Gland, screened cable, blue cover	❍ Gland, copper stocking	❍ Gland, copper stocking, blue cover	
Cable outer sheath and shielding	❍ Standard, unscreened	❍ Standard, screened		
	❍ Halogen-free, unscreened	❍ Halogen-free, screened		
Cable length	❍ 1 m ❍ 3 m	❍ 5 m ❍ 10 m		
Terminal box	❍ Aluminium	❍ Stainless steel		
Oil	❍ Mineral (standard)	❍ Synthetic (FDA)	❍ Low temperature	
Certifications	✓ CE	❍ UL approved	❍ FDA / EC 1935/2004	
Control Options (80S only)				
Backstop	❍ Clockwise	❍ Counter-clockwise		
Shell Lagging Options (NBR)				
Vulcanization	❍ Hot	❍ Cold		
Colour	❍ Black	❍ White (FDA and EC1935/2004)	❍ Blue (FDA and EC1935/2004)	
Lagging for friction drive belt	Thickness: ❍ 2 mm *	❍ 3 mm ❍ 4 mm	❍ 5 mm ❍ 6 mm	
	❍ 8 mm	❍ 10 mm ❍ 12 mm	❍ 14 mm* * Hot vulcanised only	
	Surface	❍ Smooth	❍ Longitudinal grooves	
		❍ Diamond patterned		
	V-grooved (hot vulcanised only):	❍ K6 ❍ K8	❍ K10 ❍ K13	
		❍ Other or multiple (drawing required)		
Profiled lagging for positive drive belts (hot vulcanised only)	Manufacturer of belt:	_____	Type: _____	
	Number of teeth: _____	Pitch circle diameter: _____ mm	Belt material: _____	

CONFIGURATOR I-SERIES

Drum Motor

Required delivery time	___ /___ /____		**Company** _____	
Contact and reference	_____			
Quantity	_____			
Application	❍ Friction drive belt	❍ Positive drive belt / No belt	❍ Type of industry:_____	
	❍ Dry	❍ Wet ❍ Washdown	❍ Ambient temperature: _____°C	
Mounting	❍ Horizontal (max ± 5°)	❍ Other angle of mounting:_____		
Motor Data:				
Motor type	❍ 80i ❍ 113i	❍ 138i ❍ 165i	❍ 217i	
Rated power	_____ kW			
Number of poles	_____			
Rated speed	_____ m/s at 50 Hz	❍ Variable speed: from _____ to _____ m/s at 50 Hz		
Gear ratio	_____			
Rated voltage	❍ 230 V ❍ 400 V	❍ Other: _____ V, 3-phase		
Frequency	❍ 50 Hz ❍ 60 Hz			
Versions:				
Length (full mm only)	SL: _____ mm	EL: _____ mm	AGL: _____ mm	
Shell profile	❍ Crowned	❍ Cylindrical	❍ Cylindrical with key	
Shell material	❍ Mild steel	❍ Stainless steel		
End housing	❍ Aluminium	❍ Stainless steel		
External seal	❍ Mild steel, galvanised labyrinth	❍ Stainless steel labyrinth	❍ Stainless steel labyrinth with FPM	
Shaft	❍ Stainless steel (standard)	❍ Cross-drilled thread, stainless steel		
	❍ Mild steel (standard)	❍ Cross-drilled thread, mild steel		
Surface roughness	❍ 15-20 µm (Ra 4- 5 µm)	❍ > 1.6 µm (Ra 0.8 µm)	❍ < 6.3 µm (Ra 1.4 µm)	
Cable connector	❍ Straight, brass/nickel	❍ Straight, stainless steel	❍ PU shaft plug	
	❍ Elbow, technopolymer	❍ Elbow, stainless steel	❍ Special cable slot connector	
Cable outer sheath and shielding	❍ Standard, unscreened	❍ Standard, screened		
	❍ Halogen-free, unscreened	❍ Halogen-free, screened		
Cable length	❍ 1 m ❍ 3 m	❍ 5 m ❍ 10 m		
Terminal box	❍ Aluminium	❍ Stainless steel	❍ Technopolymer	
Oil	❍ Mineral (standard)	❍ Synthetic (FDA)	❍ Low temperature	
Certifications	✓ CE	❍ UL approved	❍ FDA / EC 1935/2004	
Control Options				
Backstop	❍ Clockwise	❍ Counter-clockwise		
Dynamic Balancing	❍ 3 g ❍ 5 g	❍ 8 g ❍ 10 g		
Electromagnetic brake	❍ 24 V DC ❍ 104 V DC	❍ 180 V DC ❍ 207 V DC		
Rectifier	❍ Half wave rectifier	❍ Phase rectifier	❍ Bridge rectifier	
	❍ Fast acting rectifier	❍ Multiswitch rectifier		
Feedback Devices	❍ 32 pulses per rotor revolution (for 80i, 113i, 138i)	❍ 48 pulses per rotor revolution (for 165i, 217i)		
	❍ 64 pulses per rotor revolution	❍ 512 pulses per rotor revolution	❍ 1024 pulses per rotor revolution	
	❍ LTN resolver			
Shell Lagging Options (NBR)				
Vulcanization	❍ Hot	❍ Cold		
Colour	❍ Black	❍ White (FDA and EC1935/2004)	❍ Blue (FDA and EC1935/2004)	
Lagging for friction drive belt	Thickness: ❍ 2 mm *	❍ 3 mm ❍ 4 mm	❍ 5 mm* ❍ 6 mm*	
	❍ 8 mm*	❍ 10 mm* ❍ 12 mm	❍ 14 mm * ❍ 16 mm *	
		* Hot vulcanised only		
	Surface	❍ Smooth	❍ Longitudinal grooves	
		❍ Diamond patterned		
	V-grooved (hot vulcanised only):	❍ K6 ❍ K8	❍ K10 ❍ K13	
		❍ K15 ❍ K17		
		❍ Other or multiple (drawing required)		
Profiled lagging for positive drive belts (hot vulcanised only)	Manufacturer of belt:	_____	Type: _____	
	Number of teeth: _____	Pitch circle diameter: _____ mm	Belt material: _____	

CONFIGURATOR D-SERIES

Drum Motor

Required delivery time	___ /___ /____		**Company** _____	
Contact and reference	_____			
Quantity	_____			
Application	❍ Friction drive belt	❍ Positive drive belt / No belt	❍ Type of industry:_____	
	❍ Dry	❍ Wet	❍ Wash-down	❍ Ambient temperature: _____°C
Mounting	❍ Horizontal (max ± 5°)	❍ Other angle of mounting:_____		
Motor Data:				
Motor type	❍ 80D	❍ 113D		
Rated power (Number of poles: 8)	_____ kW			
Rated speed	_____ m/s at 200 Hz	❍ Variable speed: from _____ to _____ m/s at 200 Hz		
Gear ratio	_____			
Rated voltage	❍ - 200,240 V 3 phase	❍ - 300,440 V 3 phase	❍ 48 V DC	❍ Other: _____ V, 3 phase
Frequency	❍ 50 Hz	❍ 60 Hz		
Versions:				
Internal design:	❍ Standard	❍ TE belt tension reinforcement		
Length (full mm only)	SL: _____ mm	EL: _____ mm	AGL: _____ mm	
Shell profile	❍ Crowned	❍ Cylindrical	❍ Cylindrical with key	❍ Hexagonal
Shell material	❍ Mild steel	❍ Stainless steel		
End housing	✓ Stainless steel			
External seal	✓ deflection seal PTFE			
Shaft	✓ Stainless steel			
Surface roughness	❍ 15-20 µm (Ra 4- 5 µm)	❍ < 6.3 µm (Ra 1.4 µm)	❍ > 1.6 µm (Ra 0.8 µm)	
Cable connector	❍ Straight, brass/nickel	❍ Straight, stainless steel	❍ Elbow, technopolymer	
	❍ Elbow, stainless steel	❍ Straight cable nipple	❍ Straight cable connector for feedback device	
	❍ Elbow connector stainless steel for feedback device		❍ Feedback device has 2 cables	
Cable	❍ Standard, screened	❍ Halogen-free, screened		
Cable length	❍ 1 m ❍ 2 m*	❍ 3 m ❍ 5 m	❍ 10 m	
Oil	❍ Synthetic (FDA)	❍ Low temperature	❍ Oil-free	
Certifications	✓ CE	❍ cULus approved	❍ FDA / EC 1935/2004	
Control Options				
Feedback Devices	❍ RLS incremental encoder	❍ LTN resolver	❍ SKS 36 Hiperface	
Shell Lagging Options (NBR)				
Vulcanization	❍ Hot			
Colour	❍ Black	❍ White (FDA and EC1935/2004)	❍ Blue (FDA and EC1935/2004)	
Lagging for friction drive belt	Thickness: ❍ 2 mm*	❍ 3 mm ❍ 4 mm	❍ 5 mm* ❍ 6 mm*	
	❍ 8 mm*	❍ 10 mm* ❍ 12 mm*	❍ 14 mm * ❍ 16 mm *	
	Surface	❍ Smooth	❍ Longitudinal grooves	
		❍ Diamond patterned	* Hot vulcanised only	
	V-grooved (hot vulcanised only):	❍ K6 ❍ K8	❍ K10 ❍ K13	
		❍ K15 ❍ K17	❍ Other or multiple (drawing required)	
Profiled lagging and sprockets for positive drive belts				
Transmission	❍ Lagging	❍ Sprockets		
Belt manufacturer	_____			
Belt series	_____			
Belt material	_____			
Belt type and variant	_____			
Required belt speed	_____			
Number of teeth	_____			
Reversible	❍ Yes	❍ No		
Outside diameter (OD) in mm	_____			
Pitch circle diameter (PCD) in mm	_____			
Lagging / Sprocket material	❍ NBR	❍ PU	❍ POM	
	❍ Stainless steel	other_____		

INTERROLL CENTRE OF EXCELLENCE – DRUM MOTORS

The Interroll Centre of Excellence in Baal (near to Düsseldorf, Germany) concentrates on drum motors used as drive solutions in belt conveyors for food processing and other systems for internal logistics, as well as in various other industrial sectors. In this product sector, the company is responsible within the global Interroll Group for all technical concerns ranging from development and application engineering to production and support for local Interroll companies. Production facilities also include the Coating Centre for rubberised drum motors intended for hygienic production stretches in the food processing industry.

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Inspired by efficiency

Established in 1959 Interroll has grown to become the world's leading supplier of key products for internal logistics. Whether boxes, pallets or soft goods are to be handled, no other supplier has such a complete product range on offer. That is why system integrators, OEMs and operators select Interroll as their partner for their internal logistics business. Worldwide. The Interroll global network ensures quick delivery and superior service for every local customer. We inspire our customers and provide opportunities for them to increase efficiency.

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