en-UK APR/2011

INTERROLL®

INSPIRED BY EFFICIENCY

SUPERMARKET SOLUTIONS

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THE INTERROLL WORLDWIDE GROUP

Interroll is one of the world‘s leading manufacturers of key products for unit load handling systems, internal logistics and automation.

The Interroll solutions are used primarily within the area of food processing, airport logistics, postal services, distribution and in various segments of industry.
The products include easy-to-integrate drive solutions such as drum motors for belt conveyors, DC-powered and non-powered rollers for conveyor systems; energy-efficient flow storage modules for compact pallet/container racking systems in distribution centres; crossbelt sorters, belt curves and other user-friendly conveyor modules for cost-efficient material flow systems.

Interroll serves more than 23,000 customers, mainly multinational companies and system integrators as well as engineering specialists, regional plant manufacturers and users.

Interroll has 1,500 employees working in 28 companies and is listed on the SIX Swiss Exchange.
Managed by a strategic holding company based in Sant‘Antonino, Switzerland, the group operates with two business divisions: "Global Sales & Service" markets and distributes the full range of Interroll products according to specified target markets, while "Products & Technology" oversees the global Centres of Excellence and other production sites, with responsibilities ranging from R&D, Product Management and Strategic Purchasing to Production Technology and Manufacturing.

Interroll‘s key markets

Food & Beverage Industry

Manufacturing

Parcel, Postal and Courier

Distribution

Airport Industry

Health Care Industry

INTERROLL – THE HEART OF INTRALOGISTICS

Conveying

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.

- Conveyor Rollers
- Drum Motors and Idler Pulleys
- 24 V DC Drives (RollerDrives)
- Controllers for RollerDrives and Drum Motors

Our product portfolio represents a proven quality standard for dynamic, efficient material flow across all continents and in all sectors. Interroll solutions convey, accumulate, insert, remove and combine 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.

Linking and Distributing

Millions of items travel through the world's flow of goods every day. Ever more varied, individually commissioned products must be delivered on time to the correct destination. This is a trend that requires a performance-based logistics system with economic material flow solutions. Interroll's innovative conveyor modules and subsystems are always ready for systems and their key locations:

- Crossbelt Sorters
- Belt Curves and Belt Merges
- Intelliveyor Conveyor Modules with zero-pressure accumulation
- Roller Conveyors
- Belt Conveyors

Precisely pre-assembled at the factory and rapidly delivered, the conveyor modules and subsystems can be easily integrated into the larger complete system – 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 (two to three years); adaptability in the event of change.

Storage and Picking

Efficient 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 minimal space. And because the needs of our customers are as diverse as their products, our central and peripheral subsystems offer unlimited design options.

- Flow Storage
- Wheel Flow
- Pushback
- Flex Flow

The picking times can scarcely be beaten. The return on investment for the operator is less than two years. Of course, "Just in Time" comes as standard.

INTERROLL SUPERMARKET SOLUTIONS

Make supermarket goods moving most efficiently

Interroll is one of the world's leading specialists for conveyor technologies used in Supermarket solutions. We strongly believe that our solutions are the best you can get for your checkout systems and Retail Based Reversed Vending Machines (RBRVM) and the corresponding backroom installations, used for returning bottles, cans and cases for reuse or recycling. Leading OEMs and system integrators all over the world rely on the Interroll brand to improve the efficiency of conveyor technology at retailer stores and supermarkets. Interroll drum motor technology is also used in distribution hubs – even for the heaviest goods such as entire pallets. So the brand of Interroll is renowned in the entire supply chain for supermarket and retail store systems, keeping food and goods moving.

Dedicated solutions

Interroll offers dedicated core technologies for all conveyor technology-driven supermarket applications: from the drum motors and conveyor rollers including all needed accessories such as mounting brackets and passive rollers up to pre-assembled and ready to install conveyor cassettes.

Designed to the needs

Interroll drives and rollers are perfectly tailored to the specific requirements of checkout systems and RBRVMs. Engineers especially prefer the fast and easy design-in and installation of Interroll products, which make construction and mounting a simple task. Another, maybe even more irresistible argument for Interroll solutions is the space saving argument: The Interroll Drum Motors feature a compact, hermetically sealed all-in-one system design. Compared to conventional drives, there is no additional space required to implement the motor, gearbox and drive train.

The sealed design is also the basis for the maintenance-free and cost effective operation of Interroll Drum Motors, minimizing downtimes and maintenance efforts. And that the high energy efficiency reduces power consumption, energy costs and therefore the TCO of solutions based on Interroll products is just another winning argument.

Intelligent details

Intelligent details such as the patented belt "quick-release" for a smooth and quick installation and replacement of the conveyor belt or the optional Interroll-specific plug for the cabling make Interroll products a real plug-and-play solution.

The smooth start and stop of the motors for checkout systems adds another benefit without the need for engineers to implement this functionality by additional components.

The substantial part of your applications

So all fundamental requirements for dedicated supermarket and retail store conveyors are a substantial part of what Interroll technology delivers out of the box. Finally, the tremendous number of options available to configure Interroll products gives you the freedom to tailor them perfectly to your dedicated conveyor application. Thanks to Interroll's flexible and reliable delivery management, our products will be delivered punctually, wherever you are, to perfectly support the successful JIT roll-out of your solution.

INTRODUCTION TO INTERROLL DRUM MOTORS

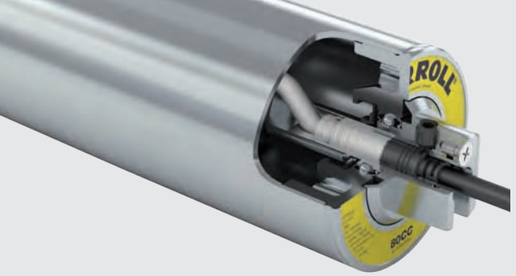
- ✓ **Totally enclosed** — The motor, gearbox and bearings are totally enclosed and sealed inside a steel shell, therefore they are unlikely to fail due to harmful environmental conditions such as dust, fluid etc.
- ✓ **Space saving** — Because all components are located in the steel shell, drum motors take up much less space than conventional drives.
- ✓ **Safe** — As a self-contained component without protruding parts and fixed external shaft, an Interroll Drum Motor is probably the safest drive unit available for state of the art supermarket equipment.
- ✓ **Maintenance-free** — The sealed-for-life design ensures trouble-free conveying for all kinds of materials.
- ✓ **Energy efficient** — Compared with many geared motor drives commonly used in industry today, Interroll Drum Motors use at least 32 % less energy, thus helping to reduce the global carbon footprint.
- ✓ **Easy installation** — Interroll Drum Motors are much quicker and easier to install than conventional drive systems. Fewer parts mean lower costs for conveyor design and purchasing of parts.
- ✓ **Plug and play** — All Interroll 80C and 113C Drum Motors are based on our proprietary plug and play solution, which ensures the very flexible installation of the drum motor and cabling.

INTERROLL CASSETTES

- ✓ **Easy installation** — Interroll Cassettes are much quicker and easier to install than conventional conveyors installed at the checkout counter or other machines, because one component is already tested and “run-in”. Fewer parts mean lower costs for conveyor design and purchasing of parts.
- ✓ **Customised** — Interroll Cassettes can be combined with customised or standard side rails etc.
- ✓ **Easy to service** — Interroll Cassettes are equipped with a patented belt “quick-release” in order to ensure the smooth and quick servicing of the conveyor.

DRUM MOTORS FOR SUPERMARKETS

	80C	80S-SMP	80S DC		113C	113S-SMP	113S DC
Diameter	81.5 mm	81.5 mm	81.5 mm		113.3 mm	113.3 mm	113.3 mm
Gear material	Techno-polymers	Techno-polymers	Techno-polymers		Techno-polymers	Techno-polymers	Techno-polymers
Voltage	230 V 50 Hz (IEC 38) 115 V 60 Hz (on request)	230/400 V ±5 % (IEC 34/38) 115 V 60 Hz (on request)	24 V DC		230 V 50 Hz (IEC 38) 115 V 60 Hz (on request)	230/400 V ±5 % (IEC 34/38) 115 V 60 Hz (on request)	24 V DC
Rated power	0.05 to 0.085 kW	0.025 to 0.11 kW	0.044 kW		0.06 to 0.11 kW	0.04 to 0.33 kW	0.044 kW
Rated torque	16.3 to 20.0 Nm	1.9 to 29.0 Nm	1.1 to 12.6 Nm		16 to 44 Nm	3.1 to 43.8 Nm	1.1 to 12.6 Nm
Belt pull	400 to 510 N	46 to 700 N	28 to 315 N		273 to 779 N	55 to 774 N	19 to 223 N
Velocity of the shell	0.16 to 0.18 m/s	0.05 to 0.88 m/s	0.12 to 1.10 m/s		0.12 to 0.18 m/s	0.07 to 2.12 m/s	0.18 to 1.56 m/s
Shell length SL	260 to 602 mm	260 to 952 mm	285 to 602 mm		253 to 702 mm	240 to 1,090 mm	273 to 702 mm
Plug	✓				✓		
Friction drive belt	✓	✓	✓		✓	✓	✓
Positive drive belt			✓			(✓)	✓
Without belt		✓	✓			✓	✓
	see page 12	*see page 16*	*see page 22*		*see page 26*	*see page 30*	*see page 36*



INTERROLL DRUM MOTOR 80C

Compact premium drive for supermarkets

Product Description

Applications

Because of its strength, reliability and zero maintenance, this drum motor is perfect for supermarket applications.

- ✓ Small light-duty conveyors
- ✓ Supermarket checkout conveyors
- ✓ Bottle recycling

Characteristics

- ✓ 1-phase AC induction motor
- ✓ Single-rated voltage
- ✓ Integral motor protection
- ✓ Techno-polymer planetary gearbox
- ✓ Low noise
- ✓ Lightweight
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible

Technical Data

Motor data	
Motor type	Asynchronous squirrel cage motor, IEC 34 (VDE 0530)
Insulation class of motor windings	Class B, IEC 34 (VDE 0530)
Voltage	230 V 50 Hz (IEC 38) 115 V 60 Hz (on request)
Frequency	50 Hz
Internal shaft sealing system	Double-lipped, NBR
Protection rating	IP64
Thermal protection	Bi-metal switch
Ambient temperature, 1-phase motor	+10 to +40 °C
Dimensions	
Shell length SL	280 to 602 mm

Order Information

Please refer to fold-out page at the end of the catalogue.

Material Versions

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

Component	Version	Material	
		Aluminium	Mild steel
Shell	Crowned		✓
	Cylindrical		✓
End housing	Standard	✓	
Shaft cap	Standard	✓	
Electrical connector	Plug solutions Straight/90°	✓	
	Plug solutions 90° protected	✓	

Please contact your Interroll customer consultant for further versions.

Accessories

- Anti-vibration brackets, see p 44
- Idler pulleys, see p 46
- Conveyor rollers, see p 48

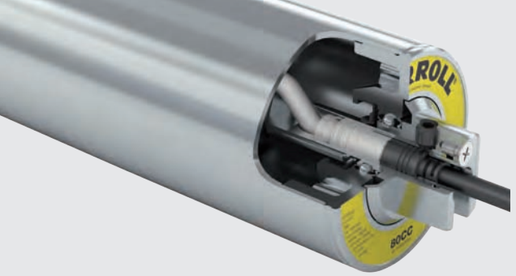
Product Range

The following tables give an overview of the possible motor versions. Choosing versions without exclamation mark will ensure the lowest cost and fastest delivery. When ordering, please specify the version in accordance with the configurator on the fold-out page.

Mechanical data for 1-phase motors

P_N	np	gs	i	v	n_A	M_A	F_N	TE	Min. start weight	SL_{min}
kW				m/s	min^{-1}	Nm	N	N	Kg	mm
0.050	2	3	71.56	0.16	38.4	10.4	256	2,000	71	260
			63.51	0.18	43.3	9.3	227	2,000	63	260
0.075	2	3	71.56	0.16	38.4	16.0	391	2,000	106	270
			63.51	0.18	43.3	14.2	347	2,000	94	270
0.085	2	3	71.56	0.16	38.4	18.4	452	2,000	120	285
			63.51	0.18	43.3	16.3	401	2,000	107	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 shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
TE	Max. belt tension
SL_{min}	Min. shell length



INTERROLL DRUM MOTOR 80C

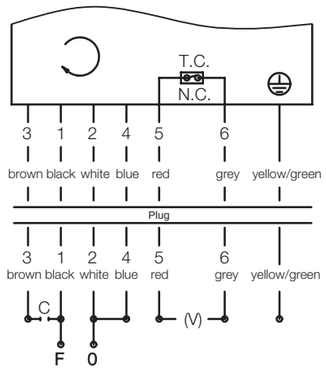
Compact premium drive for supermarkets

Cable Specifications

Interroll plug solution includes a strain relief piece. Please order the separately available plug cable to enjoy the advantages of plug and play technology and the flexible preinstallation of your drum motor.

- 7 x 0.5 mm²
- Wirepins for proper installation
- Ø Cable: 7 mm
- Length: 1.5 / 2 / 3 / 5 m (Other lengths available on request)
- Available with common connectors

Connection Diagrams



Note: When drum motor is without thermal controller (5) and (6) is blind.
Note: For CCW rotation interchange brown (3) and blue (4).

Dimensions

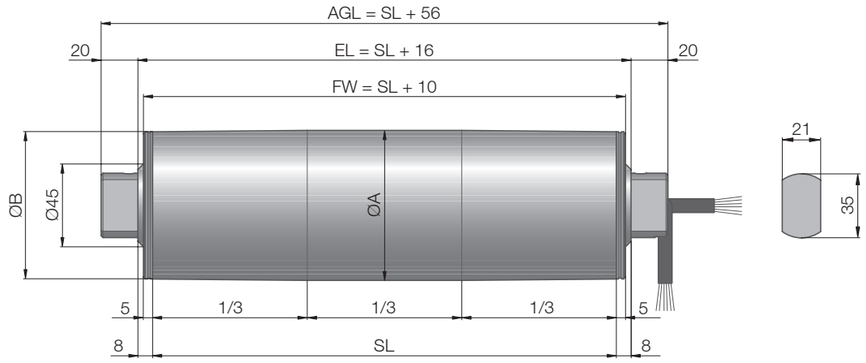


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
80C crowned shell	81.5	80.0
80C cylindrical shell	80.5	80.5

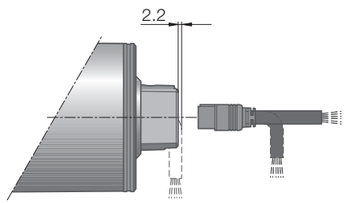


Fig.: Plug

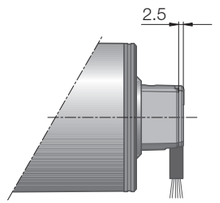
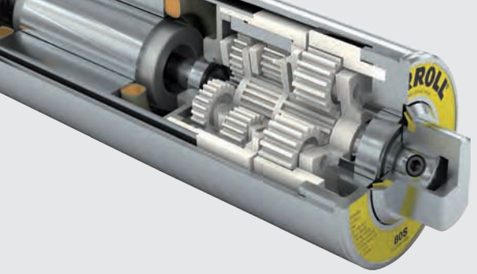


Fig.: Plug 90° with cable protection

The drum motor's weight depends on its length.

Shell length SL in mm	280	Weight increases by 0.4 kg in 50 mm increments	602
Average weight in kg	5		7.5



INTERROLL DRUM MOTOR 80S-SMP

Compact premium drive for small light-duty conveyors

Applications

Characteristics

Product Description

Because of its strength, reliability and zero maintenance, this drum motor is perfect for supermarket applications.

- ✓ Small light-duty conveyors
- ✓ Bottle recycling
- ✓ Supermarket checkout conveyors

- ✓ 3-phase or 1-phase AC induction motor
- ✓ Single-rated voltage
- ✓ Integral motor protection
- ✓ Techno-polymer planetary gearbox
- ✓ Low noise
- ✓ Lightweight
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible

Note: For applications without belt please use a frequency converter.

Technical Data

Motor 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) 115 V 60 Hz (on request)
Frequency	50 Hz
Internal shaft sealing system	Double-lipped, NBR
External shaft sealing system	Deflection seal, NBR (optional)
Protection rate	IP64 (IP66 optional)
Thermal protection	Bi-metal switch
Ambient temperature, 3-phase motor	+5 to +40 °C
Ambient temperature, 1-phase motor	+10 to +40 °C
Dimensions	
Shell length SL	260 to 952 mm

Order Information

Please refer to fold-out page at the end of the catalogue.

Material Versions

Component	Version	Material	
		Aluminium	Mild steel
Shell	Crowned		✓
	Cylindrical		✓
End housing	Standard	✓	
Shaft cap	Standard	✓	

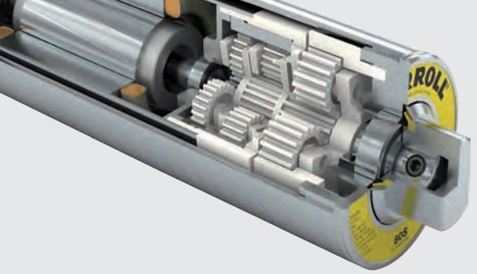
Options

- Lagging for friction drive belts
- Backstops
- Balancing
- Low temperature oil
- UL/cUL safety certifications
- Non-horizontal mounting (more than ± 5°)

Note: Please refer to the drum motor catalogue for detailed information.

Accessories

- Anti-vibration brackets, see p 44
- Idler pulleys, see p 46
- Conveyor rollers, see p 48



INTERROLL DRUM MOTOR 80S-SMP

Compact premium drive for small light-duty conveyors

Motor versions

Product Range

The following tables give an overview of the possible motor versions. Choosing versions without exclamation mark will ensure the lowest cost and fastest delivery. When ordering, please specify the version in accordance with the configurator on the fold-out page.

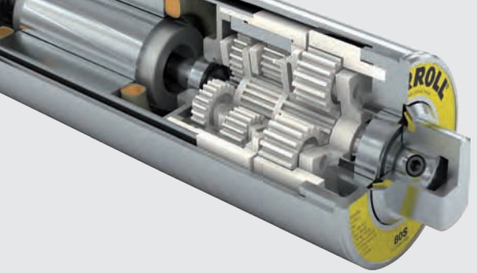
Mechanical data for 3-phase motors

P_N	np	gs	i	v	n_A	M_A	F_N	TE	SL_{min}
kW				m/s	min^{-1}	Nm	N	N	mm
0.04	4	3	78.55	0.07	16.8	19.5	479	2,000	270
			71.56	0.08	18.4	17.8	437	2,000	270
			63.51	0.09	20.8	15.8	387	2,000	270
0.05	2	3	115.20	0.10	23.9	16.8	412	2,000	270
0.06	4	2	19.20	0.29	68.8	7.5	183	1,500	295
			16.00	0.35	82.5	6.2	152	1,500	295
			13.09	0.43	100.8	5.1	125	1,500	295
0.075	2	3	96.00	0.13	29.4	20.6	505	2,000	270
0.085	2	3	78.55	0.15	35.6	19.5	479	2,000	270
			71.56	0.17	39.1	17.8	437	2,000	270
			63.51	0.19	44.1	15.8	387	2,000	270
			52.92	0.23	52.9	13.2	323	2,000	270
			48.79	0.24	57.4	12.1	298	2,000	270
			43.30	0.28	64.7	10.8	264	2,000	270
		2	19.20	0.62	145.8	5.0	123	1,500	270
			16.00	0.75	175.0	4.2	103	1,500	270
			13.09	0.91	213.9	3.4	84	1,500	270

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 shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
TE	Max. belt tension
SL_{min}	Min. shell length

Mechanical data for 1-phase motors

P_N	np	gs	i	v	n_A	M_A	F_N	TE	SL_{min}
kW				m/s	min^{-1}	Nm	N	N	mm
0.025	4	3	115.20	0.05	11.5	17.8	436	2,000	285
			96.00	0.06	13.8	14.8	364	2,000	285
			78.55	0.07	16.8	12.1	297	2,000	285
			71.56	0.08	18.4	11.0	271	2,000	285
		2	19.20	0.29	68.8	3.1	77	1,500	285
			16.00	0.35	82.5	2.6	64	1,500	285
			13.09	0.43	100.8	2.1	52	1,500	285
0.05	2	3	115.20	0.10	23.9	16.8	412	2,000	260
			96.00	0.12	28.6	14.0	343	2,000	260
			78.55	0.15	35.0	11.4	281	2,000	260
			71.56	0.16	38.4	10.4	256	2,000	260
			63.51	0.18	43.3	9.3	227	2,000	260
			52.92	0.22	52.0	7.7	189	2,000	260
			48.79	0.24	56.4	7.1	175	2,000	260
			43.30	0.27	63.5	6.3	155	2,000	260
		2	19.20	0.61	143.2	2.9	72	1,500	260
			16.00	0.73	171.9	2.5	60	1,500	260
			13.09	0.90	210.1	2.0	49	1,500	260
0.075	2	3	96.00	0.12	28.6	21.4	525	2,000	270
			78.55	0.15	35.0	17.5	430	2,000	270
			71.56	0.16	38.4	16.0	391	2,000	270
			63.51	0.18	43.3	14.2	347	2,000	270
			52.92	0.22	52.0	11.8	290	2,000	270
			48.79	0.24	56.4	10.9	267	2,000	270
			43.30	0.27	63.5	9.7	237	2,000	270
		2	19.20	0.61	143.2	4.5	111	1,500	270
			16.00	0.73	171.9	3.8	92	1,500	270
			13.09	0.90	210.1	3.1	75	1,500	270
0.085	2	3	78.55	0.15	35.0	20.2	496	2,000	285
			71.56	0.16	38.4	18.4	452	2,000	285
			63.51	0.18	43.3	16.3	401	2,000	285
			52.92	0.22	52.0	13.6	334	2,000	285
			48.79	0.24	56.4	12.6	308	2,000	285
			43.30	0.27	63.5	11.1	273	2,000	285
		2	19.20	0.61	143.2	5.2	128	1,500	285
			16.00	0.73	171.9	4.3	106	1,500	285
			13.09	0.90	210.1	3.5	87	1,500	285
0.11	2	3	63.51	0.18	43.3	20.7	508	2,000	285
			52.92	0.22	52.0	17.2	423	2,000	285
			48.79	0.24	56.4	15.9	390	2,000	285
			43.30	0.27	63.5	14.1	346	2,000	285
		2	19.20	0.61	143.2	6.6	162	1,500	285
			16.00	0.73	171.9	5.5	135	1,500	285
			13.09	0.90	210.1	4.5	110	1,500	285



INTERROLL
DRUM MOTOR 80S-SMP

Compact premium drive for small light-duty conveyors

Cable Specifications

- 6 x 0.5 mm², 7 x 0.5 mm²
- Wirepins for proper installation
- Ø Cable: 7 mm
- Length: 1.5 / 2 / 3 / 5 m (Other lengths available on request)
- Screened cable for frequency converter operation and halogen-free cable available on request

Connection Diagrams

For connection diagrams, see planning section on p 90.

Dimensions

Standard dimensions

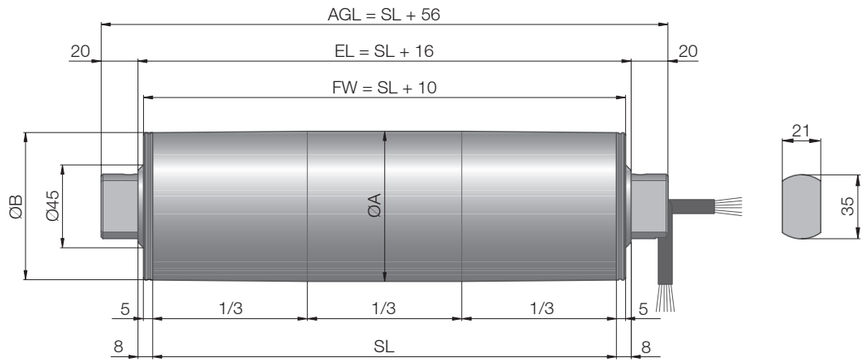


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
80S-SMP crowned shell length SL 260 to 602 mm	81.5	80.0
80S-SMP crowned shell length SL 602 to 952 mm	83.0	81.0
80S-SMP cylindrical shell length SL 260 to 602 mm	80.5	80.5
80S-SMP cylindrical shell length SL 602 to 952 mm	83.0	83.0

Connector dimensions

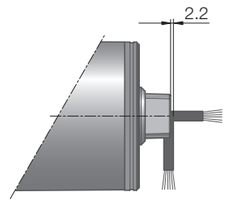
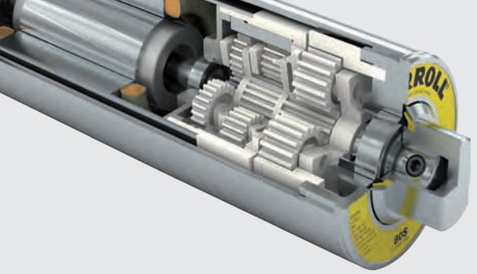


Fig.: Shaft cap

Standard length and weight

The drum motor's weight depends on its length.

Shell length SL in mm	260	Weight increases by 0.6 kg in 50 mm increments	952
Average weight in kg	4.6		13.1



INTERROLL DRUM MOTOR 80S DC

Compact premium drive for small light-duty conveyors

Applications

Characteristics

Product Description

Because of its strength, reliability and zero maintenance, this drum motor is perfect for supermarket applications.

- ✓ Small light-duty conveyors
- ✓ Bottle recycling
- ✓ Supermarket checkout conveyors

- ✓ Brush type 24 V DC
- ✓ Techno-polymer planetary gearbox
- ✓ Low noise
- ✓ Lightweight
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible

Technical Data

Motor data	
Motor type	Brush type 24 V DC
Insulation class of motor windings	Class B, IEC 34 (VDE 0530)
Voltage	24 V DC
Internal shaft sealing system	Double-lipped, NBR
External shaft sealing system	Deflection seal, NBR
Protection rate	IP64
Ambient temperature, 1-phase motor	+10 to +40 °C
Dimensions	
Shell length SL	285 to 602 mm

Order Information

Please refer to fold-out page at the end of the catalogue.

Material Versions

Component	Version	Material	
		Aluminium	**Mild steel**
Shell	Crowned		✓
	Cylindrical		✓
End housing	Standard	✓	
Shaft cap	Standard	✓	

Options

- Lagging for friction drive belts
- Sprockets for plastic modular belts
- Backstops
- Balancing
- Low temperature grease
- UL/cUL safety certifications
- Non-horizontal mounting (more than ± 5°)

Note: Please refer to the drum motor catalogue for detailed information.

Accessories

- Anti-vibration brackets, see p 44
- Idler pulleys, see p 46
- Conveyor rollers, see p 48

Product Range

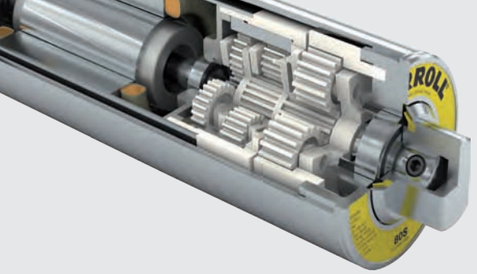
The following tables give an overview of the possible motor versions. Choosing versions without exclamation mark will ensure the lowest cost and fastest delivery. When ordering, please specify the version in accordance with the configurator on the fold-out page.

Mechanical data for 1-phase motors

P_N	gs	i	v	n_A	M_A	F_N	TE	Min. start weight	SL_{min}
kW			**m/s**	**min^{-1}**	**Nm**	**N**	**N**	**Kg**	**mm**
0.044	3	115.2	0.12	28	12.6	315	2,000	100	285
		96.0	0.15	35	10.5	263	2,000	80	285
		78.5	0.18	42	8.6	215	2,000	67	285
		52.9	0.27	63	5.8	175	2,000	52	285
		71.6	0.20	47	7.8	145	2,000	44	285
		63.5	0.23	54	7.0	195	2,000	60	285
		43.3	0.33	77	4.7	118	2,000	36	285
		48.8	0.30	70	5.4	135	2,000	40	285
		19.2	0.76	178	1.6	40	1,500	16	285
		16.0	0.90	211	1.3	33	1,500	13	285
		13.1	1.10	258	1.1	28	1,500	11	285

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

Motor versions



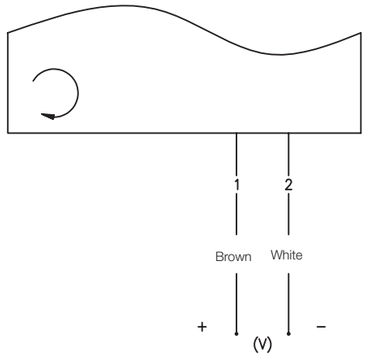
INTERROLL
DRUM MOTOR 80S DC

Compact premium drive for small light-duty conveyors

Cable Specifications

- 2 x 1.5 mm²
- Halogen-free
- Ø Cable: 7 mm
- Length: Minimum 1.1 m (Other lengths available on request)
- Availbale with common connectors

Connection Diagrams



Note: For CCW rotation interchange brown (1) and white (2).

Dimensions

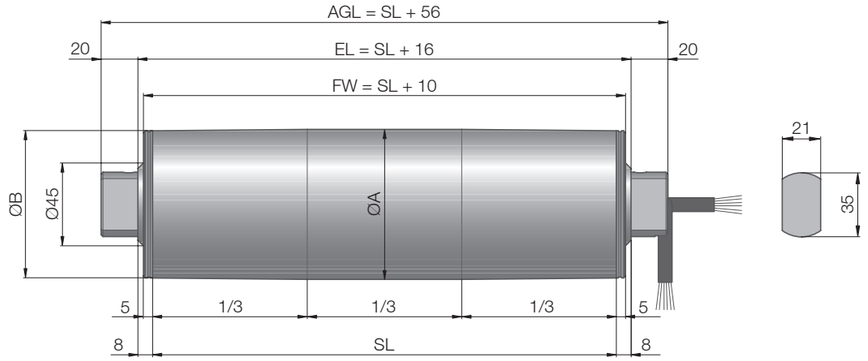


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
80S DC crowned shell	81.5	80.0
80S DC cylindrical shell	80.5	80.5

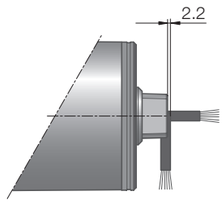


Fig.: Shaft cap

The drum motor‘s weight depends on its length.

Shell length SL in mm	285	Weight increases by 0.35 kg in 50 mm increments	602
Average weight in kg	4.1		6.3

INTERROLL DRUM MOTOR 113C

Compact premium drive for light-duty conveyors

Product Description

Applications

Because of its strength, reliability and zero maintenance, this drum motor is perfect for supermarket applications.

- ✓ Light-duty conveyors
- ✓ Bottle recycling
- ✓ Supermarket checkout conveyors

Characteristics

- ✓ 3-phase or 1-phase AC induction motor
- ✓ Single-rated voltage
- ✓ Integral motor protection
- ✓ Techno-polymer planetary gearbox
- ✓ Low noise
- ✓ Lightweight
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible

Technical Data

Motor data	
Motor type	Asynchronous squirrel cage motor, IEC 34 (VDE 0530)
Insulation class of motor windings	Class B, IEC 34 (VDE 0530)
Voltage	230 V ±5 % (IEC 34/38) 115 V 60 Hz (on request)
Frequency	50 Hz
Internal shaft sealing system	Double-lipped, NBR
External shaft sealing system	Deflection seal, NBR
Protection rate	IP64
Thermal protection	Bi-metal switch
Ambient temperature, 1-phase motor	+0 to +40 °C
Dimensions	
Shell length SL	253 to 702 mm

Order Information

Please refer to fold-out page at the end of the catalogue.

Material Versions

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

Component	Version	Material	
		Aluminium	Mild steel
Shell	Crowned		✓
	Cylindrical		✓
End housing	Standard	✓	
Shaft cap	Standard	✓	
Electrical connector	Plug solutions Straight/90°	✓	
	Plug solutions 90° protected	✓	

Please contact your Interroll customer consultant for further versions.

Accessories

- Anti-vibration brackets, see p 44
- Idler pulleys, see p 46
- Conveyor rollers, see p 48

Product Range

The following tables give an overview of the possible motor versions. Choosing versions without exclamation mark will ensure the lowest cost and fastest delivery. When ordering, please specify the version in accordance with the configurator on the fold-out page.

Mechanical data for 1-phase motors

Motor versions

P_N	np	gs	i	v	n_A	M_A	F_N	TE	Min. start weight	SL_{min}
kW				m/s	min^{-1}	Nm	N	N	Kg	mm
0.06	4	3	63	0.12	28	24	425	2,000	98	253
			55	0.14	33	20	354	2,000	81	253
			49.3	0.16	38	18	319	2,000	73	253
			44.1	0.18	42	16	283	2,000	65	253
0.11	4	3	63	0.12	28	44	779	2,000	180	253
			55	0.14	33	36.7	649	2,000	150	253
			49.3	0.16	38	33	584	2,000	135	253
			44.1	0.18	42	29.3	519	2,000	120	253

P_N	Rated power	n_A	Rated revolutions of the 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	TE	Max. belt tension
v	Rated velocity of the shell	SL_{min}	Min. shell length

INTERROLL DRUM MOTOR 113C

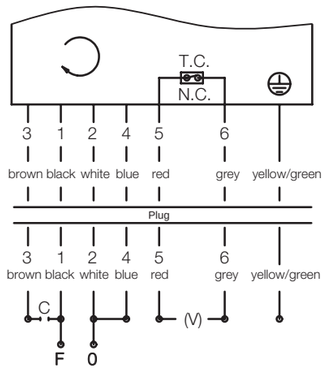
Compact premium drive for light-duty conveyors

Cable Specifications

Interroll plug solution includes a strain relief piece. Please order the separately available plug cable to enjoy the advantages of plug and play technology and the flexible preinstallation of your drum motor.

- 7 x 0.5 mm²
- Wirepins for proper installation
- Ø Cable: 7 mm
- Length: 1.5 / 2 / 3 / 5 m (Other lengths available on request)
- Available with common connectors

Connection Diagrams



Note: When drum motor is without thermal controller (5) and (6) is blind.
Note: For CCW rotation interchange brown (3) and blue (4).

Dimensions

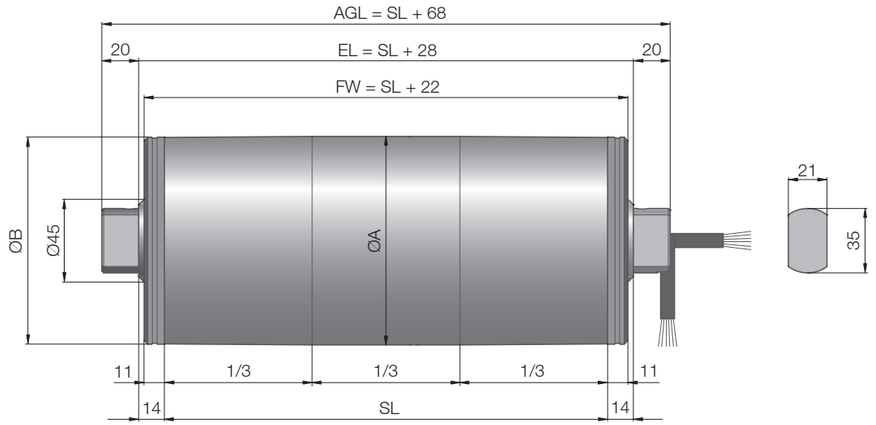


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
113C crowned shell	113.3	112.3
113C cylindrical shell	113.3	113.3

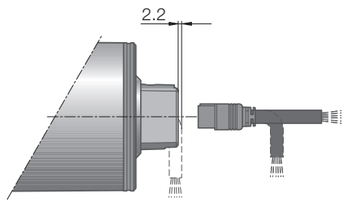


Fig.: Plug

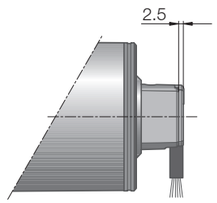
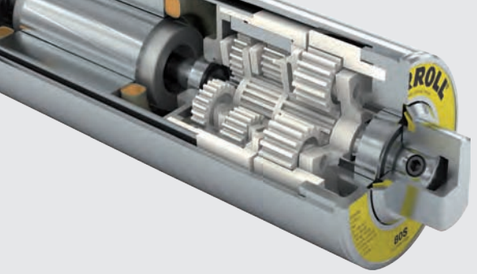


Fig.: Plug, protected

The drum motor's weight depends on its length.

Shell length SL in mm	253	Weight increases by 0.7 kg in 50 mm increments	702
Average weight in kg	6.5		12.8



INTERROLL DRUM MOTOR 113S-SMP

Compact premium drive for light-duty conveyors

Product Description

Applications

Because of its strength, reliability and zero maintenance, this drum motor is perfect for supermarket applications.

- ✓ Small light-duty conveyors
- ✓ Supermarket checkout conveyors
- ✓ Bottle recycling

Characteristics

- ✓ 3-phase or 1-phase AC induction motor
- ✓ Single-rated voltage
- ✓ Integral motor protection
- ✓ Techno-polymer planetary gearbox
- ✓ Low noise
- ✓ Lightweight
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible

Note: For applications without belt please use a frequency converter.

Technical Data

Motor 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) 115 V 60 Hz (on request)
Frequency	50 Hz
Internal shaft sealing system	Double-lipped, NBR
External shaft sealing system	Deflection seal, NBR (optional)
Protection rate	IP64 (IP66 optional)
Thermal protection	Bi-metal switch
Ambient temperature, 3-phase motor	+5 to +40 °C
Ambient temperature, 1-phase motor	+10 to +40 °C
Dimensions	
Shell length SL	240 to 1,090 mm

Order Information

Please refer to fold-out page at the end of the catalogue.

Material Versions

Component	Version	Material	
		Aluminium	**Mild steel**
Shell	Crowned		✓
	Cylindrical		✓
End housing	Standard	✓	
Shaft cap	Standard	✓	

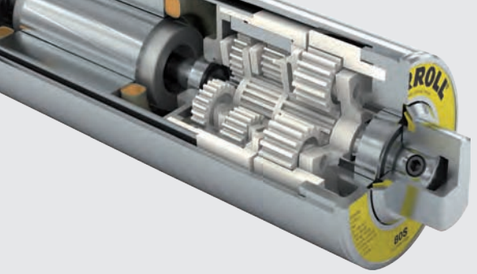
Options

- Lagging for friction drive belts
- Sprockets for plastic modular belts
- Backstops
- Balancing
- Low temperature oil
- UL/cUL safety certifications
- Non-horizontal mounting (more than ± 5°)

Note: Please refer to the drum motor catalogue for detailed information.

Accessories

- Anti-vibration brackets, see p 44
- Idler pulleys, see p 46
- Conveyor rollers, see p 48



INTERROLL DRUM MOTOR 113S-SMP

Compact premium drive for light-duty conveyors

Product Range

Motor versions

The following tables give an overview of the possible motor versions. Choosing versions without exclamation mark will ensure the lowest cost and fastest delivery. When ordering, please specify the version in accordance with the configurator on the fold-out page.

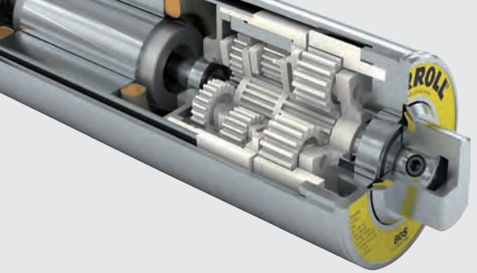
Mechanical data for 3-phase motors

P_N	np	gs	i	v	n_A	M_A	F_N	TE	SL_{min}
kW				m/s	min^{-1}	Nm	N	N	mm
0.04	8	3	63.00	0.07	11.4	28.6	505	2,700	260
			49.29	0.09	14.6	22.4	395	2,700	260
			38.51	0.11	18.7	17.5	309	2,700	260
0.11	6	2	11.57	0.44	74.8	12.6	223	1,500	275
			10.27	0.50	84.2	11.2	198	1,500	275
	4	3	63.00	0.13	21.7	41.6	734	2,000	240
			49.29	0.16	27.7	32.5	574	2,000	240
			44.09	0.18	31.0	29.1	514	2,000	240
			38.51	0.21	35.4	25.4	449	2,000	240
			30.77	0.26	44.4	20.3	359	2,000	240
			26.84	0.30	50.9	17.7	313	2,000	240
			23.96	0.34	57.0	15.8	279	2,000	240
		2	15.00	0.54	91.0	10.4	184	1,500	240
			11.57	0.70	118.0	8.0	142	1,500	240
			10.27	0.79	132.9	7.1	126	1,500	240
			8.88	0.91	153.8	6.2	109	1,500	240
			7.86	1.03	173.7	5.5	96	1,500	240
0.16	4	3	44.09	0.18	30.6	42.7	754	2,000	260
0.18	4	3	38.51	0.21	35.2	41.9	740	2,000	275
			30.77	0.26	44.0	33.5	591	2,000	275
			26.84	0.30	50.5	29.2	516	2,000	275
			23.96	0.34	56.6	26.1	461	2,000	275
		2	15.00	0.54	90.3	17.2	303	1,500	275
			11.57	0.69	117.1	13.3	234	1,500	275
			10.27	0.78	131.9	11.8	208	1,500	275
			8.88	0.91	152.6	10.2	180	1,500	275
			7.86	1.02	172.5	9.0	159	1,500	275
0.33	2	3	44.09	0.38	63.5	42.7	754	2,000	275
			38.51	0.43	72.7	37.3	659	2,000	275
			30.77	0.54	91.0	29.8	526	2,000	275
			26.84	0.62	104.3	26.0	459	2,000	275
			23.96	0.69	116.9	23.2	410	2,000	275
		2	15.00	1.11	186.7	15.3	270	1,500	275
			11.57	1.44	242.0	11.8	208	1,500	275
			10.27	1.62	272.6	10.5	185	1,500	275
			8.88	1.87	315.4	9.1	160	1,500	275
			7.86	2.11	356.4	8.0	141	1,500	275

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 shell
M_A	Rated torque of drum motor
F_N	Rated belt pull of drum motor
TE	Max. belt tension
SL_{min}	Min. shell length

Mechanical data for 1-phase motors

P_N	np	gs	i	v	n_A	M_A	F_N	TE	SL_{min}
kW				m/s	min^{-1}	Nm	N	N	mm
0.06	4	3	63.00	0.12	20.6	23.8	420	2,000	240
			49.29	0.16	26.4	18.6	328	2,000	240
			44.09	0.17	29.5	16.6	294	2,000	240
			38.51	0.20	33.8	14.5	256	2,000	240
			30.77	0.25	42.3	11.6	205	2,000	240
			26.84	0.29	48.4	10.1	179	2,000	240
			23.96	0.32	54.3	9.0	160	2,000	240
		2	15.00	0.51	86.7	6.0	105	1,500	240
			11.57	0.67	112.3	4.6	81	1,500	240
			10.27	0.75	126.5	4.1	72	1,500	240
			8.88	0.87	146.4	3.5	62	1,500	240
			7.86	0.98	165.5	3.1	55	1,500	240
0.08	6	2	15.00	0.35	59.3	11.6	206	1,800	275
			11.57	0.46	76.9	9.0	159	1,800	275
0.11	4	3	63.00	0.12	20.6	43.8	772	2,000	260
			49.29	0.16	26.4	34.2	604	2,000	260
			44.09	0.17	29.5	30.6	541	2,000	260
			38.51	0.20	33.8	26.7	472	2,000	260
			30.77	0.25	42.3	21.4	377	2,000	260
			26.84	0.29	48.4	18.6	329	2,000	260
			23.96	0.32	54.3	16.6	294	2,000	260
		2	15.00	0.51	86.7	11.0	194	1,500	260
			11.57	0.67	112.3	8.5	149	1,500	260
			10.27	0.75	126.5	7.5	133	1,500	260
			8.88	0.87	146.4	6.5	115	1,500	260
			7.86	0.98	165.5	5.7	101	1,500	260



INTERROLL
DRUM MOTOR 113S-SMP

Compact premium drive for light-duty conveyors

Cable Specifications

- 6 x 0.5 mm², 7 x 0.5 mm²
- Wirepins for proper installation
- Ø Cable: 7 mm
- Length: 1.5 / 2 / 3 / 5 m (Other lengths available on request)
- Screened cable for frequency converter operation and halogen-free cable available on request

Connection Diagrams

For connection diagrams, see planning section on p 90.

Dimensions

Standard dimensions

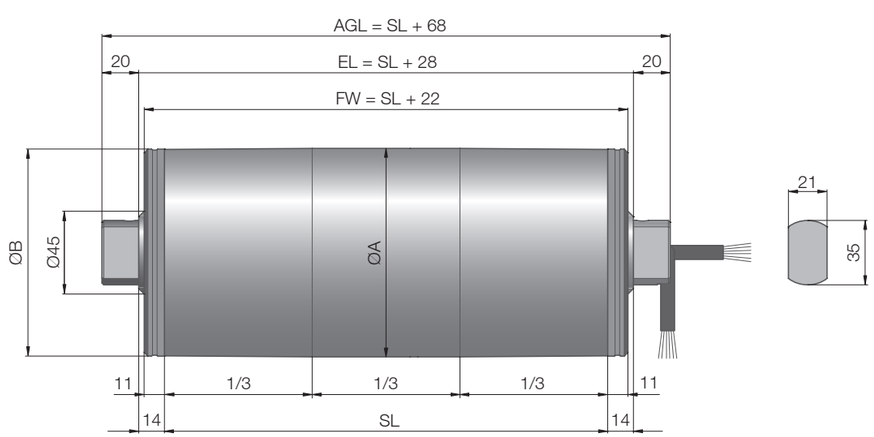


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
113S-SMP crowned shell	113.3	112.3
113S-SMP cylindrical shell	113.3	113.3

Connector dimensions

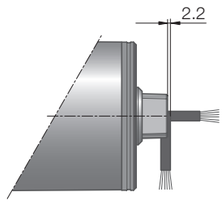
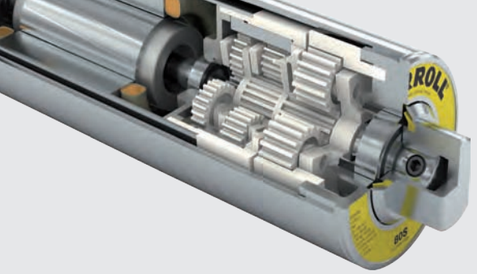


Fig.: Shaft cap

Standard length and weight

The drum motor‘s weight depends on its length.

Shell length SL in mm	240	Weight increases by 0.7 kg in 50 mm increments	1,090
Average weight in kg	7.6		19.6



INTERROLL DRUM MOTOR 113S DC

Compact premium drive for light-duty conveyors

Product Description

Applications

Because of its strength, reliability and zero maintenance, this drum motor is perfect for supermarket applications.

- ✓ Small light-duty conveyors
- ✓ Supermarket checkout conveyors
- ✓ Bottle recycling

Characteristics

- ✓ Brush type 24 V DC
- ✓ Techno-polymer planetary gearbox
- ✓ Low noise
- ✓ Lightweight
- ✓ Maintenance-free
- ✓ Lifetime lubricated
- ✓ Reversible

Note: For applications with positive drive belts please use a frequency converter or cool-running drum motor.

Technical Data

Motor data	
Motor type	Brush type 24 V DC
Insulation class of motor windings	Class B, IEC 34 (VDE 0530)
Voltage	24 V DC
Internal shaft sealing system	Double-lipped, NBR
External shaft sealing system	Deflection seal, NBR
Protection rate	IP64
Ambient temperature, 1-phase motor	+10 to +40 °C
Dimensions	
Shell length SL	273 to 702 mm

Order Information

Please refer to fold-out page at the end of the catalogue.

Material Versions

Component	Version	Material	
		Aluminium	Mild steel
Shell	Crowned		✓
	Cylindrical		✓
End housing	Standard	✓	
Shaft cap	Standard	✓	

Options

- Lagging for friction drive belts
- Sprockets for plastic modular belts
- Backstops
- Balancing
- Food-grade grease
- Low temperature grease
- UL/cUL safety certifications
- Non-horizontal mounting (more than ± 5°)

Note: Please refer to the drum motor catalogue for detailed information.

Accessories

- Anti-vibration brackets, see p 44
- Idler pulleys, see p 46
- Conveyor rollers, see p 48

Product Range

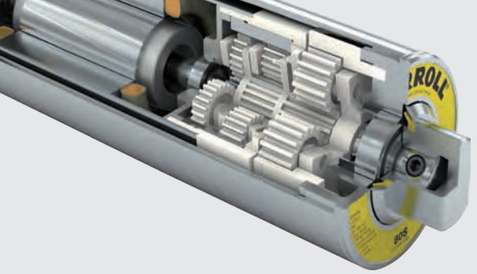
The following tables give an overview of the possible motor versions. Choosing versions without exclamation mark will ensure the lowest cost and fastest delivery. When ordering, please specify the version in accordance with the configurator on the fold-out page.

Mechanical data for 1-phase motors

Motor versions

P_N	gs	i	v	n_A	M_A	F_N	TE	Min. start weight	SL_{min}
kW			m/s	min^{-1}	Nm	N	N	Kg	mm
0.044	3	115.2	0.18	26	12.6	223	2,000	71	273
		96.0	0.21	30	10.5	186	2,000	57	273
		78.5	0.26	37	8.6	152	2,000	47	273
		71.6	0.29	42	7.8	138	2,000	42	273
		63.5	0.32	46	7.0	124	2,000	37	273
		52.9	0.39	56	5.8	103	2,000	31	273
		48.8	0.42	60	5.4	96	2,000	28	273
		43.3	0.47	68	4.7	83	2,000	25	273
		19.2	1.07	154	1.6	28	1,500	11	273
		16.0	1.28	184	1.3	23	1,500	9	273
		13.1	1.56	224	1.1	19	1,500	8	273

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



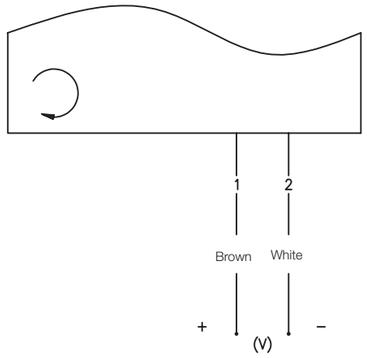
INTERROLL
DRUM MOTOR 113S DC

Compact premium drive for light-duty conveyors

Cable Specifications

- 2 x 1.5 mm²
- Halogen-free
- Ø Cable: 7 mm
- Length: Minimum 1.1 m (Other lengths available on request)
- Availbale with common connectors

Connection Diagrams



Note: For CCW rotation interchange brown (1) and white (2).

Dimensions

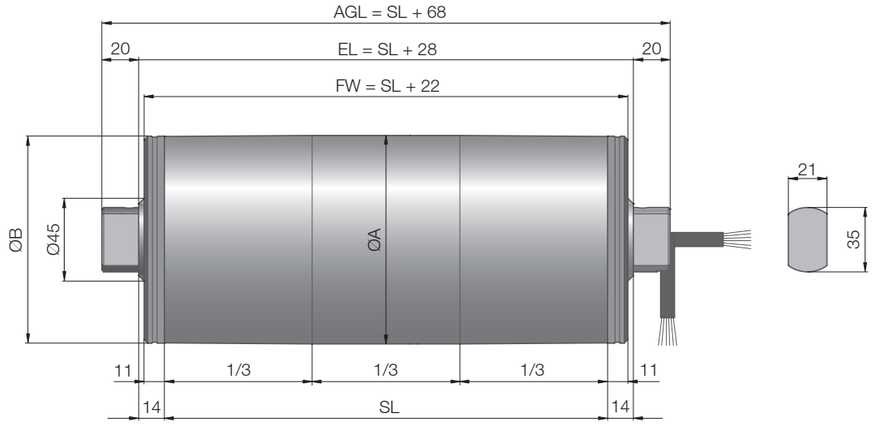


Fig.: Drum motor with straight connector

Type	Ø A mm	Ø B mm
113S DC crowned shell	113.3	112.3
113S DC cylindrical shell	113.3	113.3

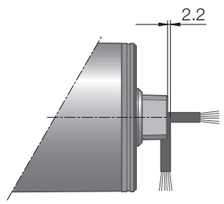


Fig.: Shaft cap

The drum motor's weight depends on its length.

Shell length SL in mm	273	Weight increases by 0.6 kg in 50 mm increments	702
Average weight in kg	5.5		10.7

INTERROLL CASSETTE SYSTEM

Drum motor drive system

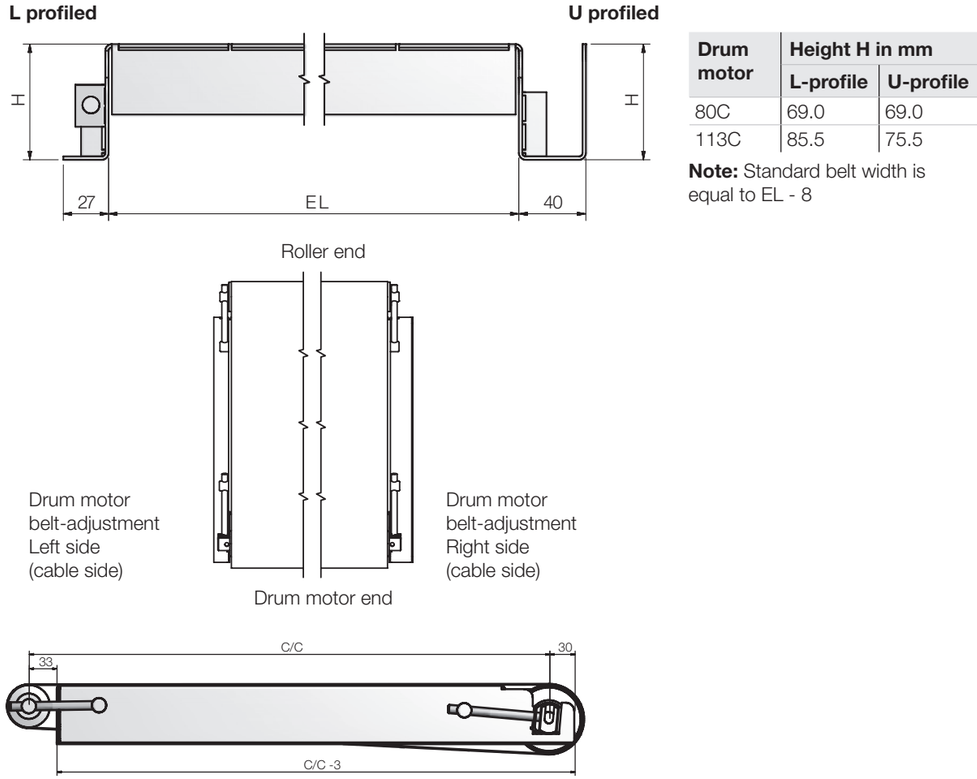
Product Description

The Interroll Cassette system is a drum motor drive system to drive a conveyor belt in supermarket checkouts and in equipment used in supermarkets, including Retail Based Reversed Vending Machinery. The Interroll Cassette system includes the Patented Quick Tension/release idler system for easy installation and change of the conveyor belt.

Technical Data

General technical data	
Design	U or L profiled Standard: Idler belt-adjustment Standard: Drum motor belt-adjustment (one side only, left is standard)
Load capacity	Small: 0 - 50 kg Medium: 50 - 100 kg Large: 100 - 150 kg > 150 kg on request
Cassette belt speed	Standard: 0.15 / 0.17 / 0.19 m/s Option: 0.11 / 0.13 / 0.21 / 0.23 / 0.25 / 0.28 / 0.30 / 0.34 m/s On request: < 0.11 and > 0.34 m/s Belt speed data are based on 1-phase drum motor speed
Length C/C	500 to 2,980 mm
Width EL	300 to 700 mm
Min. ratio length/width	2
Inclined/declined	Please contact your Interroll customer consultant
Ambient temperature	+5 to +40 °C
Drum Motor drive and Idler	
Voltage	1 x 230 V 50 Hz, 3 x 230 V 50 Hz, 3 x 400 V 50 Hz Option: 1 x 115 V 60 Hz, 3 x 230 V 60 Hz, 3 x 460 V 60 Hz
Speed	Drum motor speed is typically 5% lower than belt speed
Ø Drive	81 mm or 113 mm
Ø Idler pulley	Standard: 50 mm (Interroll 1750 idler) Option: 40 mm On request: < 40 mm
Materials	
Cassette	2 mm galvanised steel
Drum motor	Shell: surface protected End housings and shaft caps: aluminium
Idler pulley	Shell: galvanised Endhousings and endcaps: techno-polymer
Belt	Standard black PVC/PET, 2 mm, 2-ply, $K_{1\,\%}$= 6-8 N/mm Pretension of belt 0.2 - 0.3 % Other belt types on request

Dimensions



Drum motor	Height H in mm	
	L-profile	U-profile
80C	69.0	69.0
113C	85.5	75.5

Note: Standard belt width is equal to EL - 8

Fig.: Cassette shown as standard left design

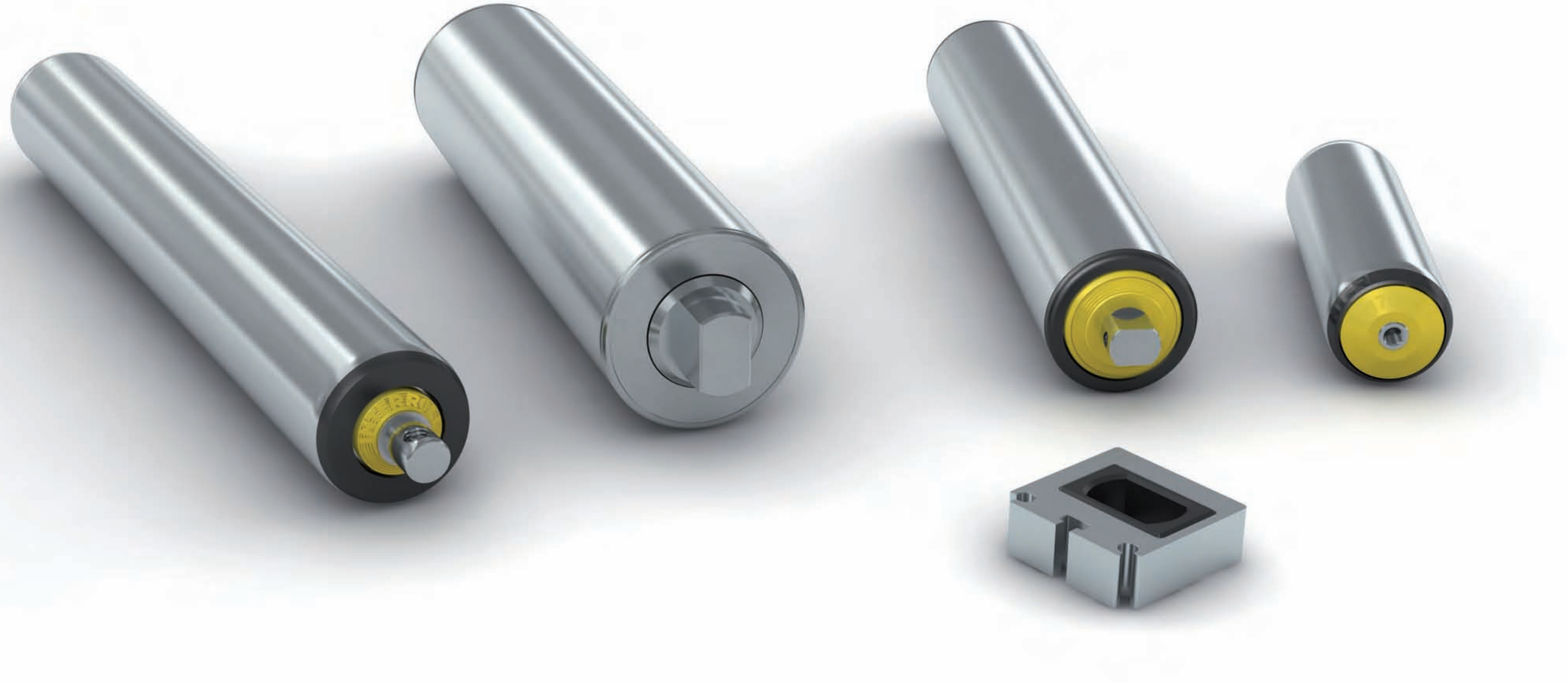
Ordering Information

Please provide the following information:

- C/C length
- EL width
- Design: U or L profiled
- Define: Left or right (important for cable outlet side)
- Ø Drum motor and Ø Idler pulley
- Required belt speed
- Load on the cassette
- Supply voltage and frequency
- Belt type (if not standard)
- Accumulation on belt

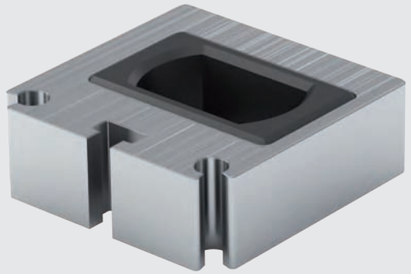
Note:

- Cable and capacitor to be ordered seperately
- The cassette can be connected for operation in both directions



ACCESSORIES

- ✓ Accessories are designed to help you to implement your logistics tasks quickly and efficiently.
- ✓ This chapter contains accessories which can be added to the Interroll Drum Motor after assembly.



ANTI-VIBRATION BRACKETS

Interroll bracket mounting system

Product Description

- ✓ For Interroll Drum Motor 80C, 80S-SMP, 80S DC, 113C, 113S-SMP, 113S DC
- ✓ 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
- ✓ With 2 brackets fitted, max. torque of drum motor must be limited to 40 Nm

Reference Number

Anti-vibration Brackets	S1DGU8
Rubber	S1DGP6

Dimensions

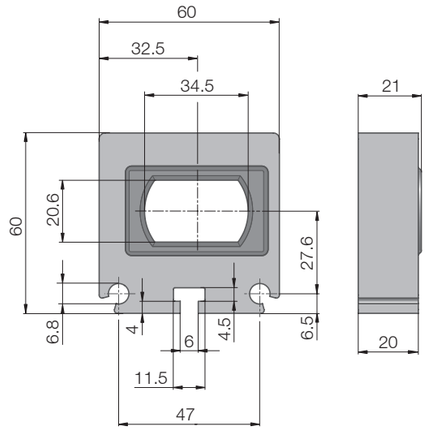


Fig.: Anti-vibration Brackets

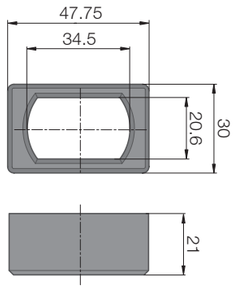


Fig.: Rubber

IDLER PULLEY WITH INTEGRAL BEARING

Idler pulleys for unit-load conveyors

Characteristics

Product Description

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

Technical Data

Protection rating	IP64
Max. belt tension	See equivalent drum motor

Versions

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

Component	Option	Material	
		Mild steel	Aluminium
Shell	Crowned	✓	
	Cylindrical	✓	
Shaft cap	Standard		✓

Dimensions

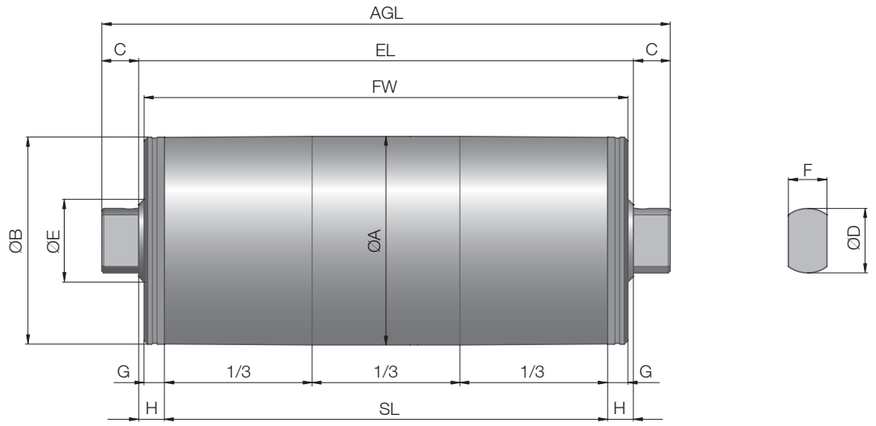


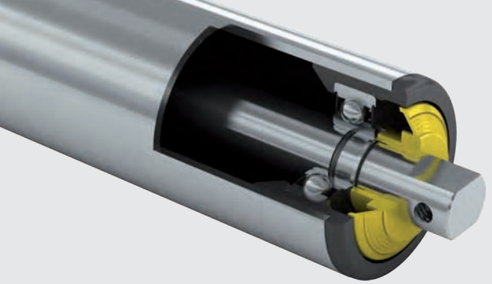
Fig.: Idler S-series

Idler pulley	Ø A mm	Ø B mm	C mm	Ø D mm	Ø E mm	F mm	G mm	H mm
80	81.5	80	20	35	45	21	3	-
113	113.3	112.3	20	35	45	21	-	3

Length and weight

The drum motor‘s weight depends on its length.

Idler pulley 80	**Shell length SL in mm**	260	Weight increases by 0.35 kg in 50 mm increments	952
	Average weight in kg	2.0		9.0
Idler pulley 113	**Shell length SL in mm**	240	Weight increases by 0.35 kg in 50 mm increments	1,090
	Average weight in kg	2.8		13.0



CONVEYOR ROLLER SERIES 1450

Snub pulleys

Characteristics

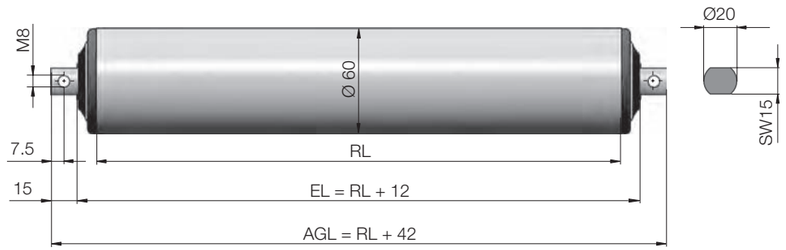
Product Description

- ✓ Suitable as snub, bend, take-up or tenioning 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
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	✓

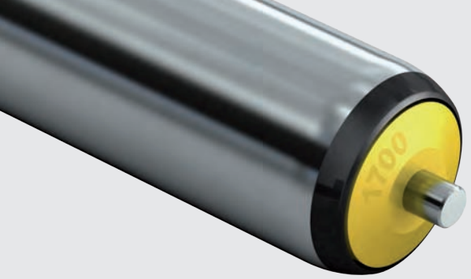
Product Range



Tube material	Reference number
Steel, bright	1.88J.B6S.S6D
Steel, galvanised	1.88J.J6S.S6D

Accessories Overview p 42

Refer to the Planning Section from page p 58 for help with planning and design



UNIVERSAL CONVEYOR ROLLER SERIES 1700

Silent conveyor rollers for heavy-duty loads

Product Description

- ✓ Suitable as support roller and return roller
- ✓ 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
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

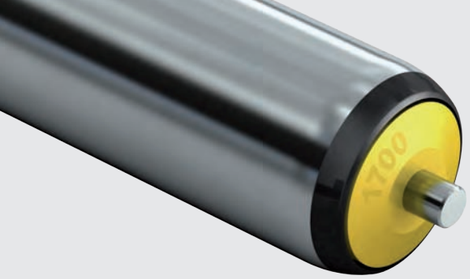
Tube				Ball bearing	Shaft
					Reference number
Material	**Ø mm**	**Torque transmission**	**Sleeve**		**11 mm hex**
Steel, zinc-plated	40 x 1.5	Without grooves	PVC, 5 mm	6002 2RZ	1.7W5.JF5.VAB
		Without grooves	–	6002 2RZ	1.7W5.JF4.VAB
	50 x 1.5	Without grooves	PVC, 2 mm	6002 2RZ	1.7X5.J72.VAB
		Without grooves	–	6002 2RZ	1.7X5.JAA.VAB
	60 x 1.5	Without grooves	–	6002 2RZ	1.7Y5.JAB.VAB

Female threaded shaft version

Tube				Ball bearing	Shaft	
					Reference number	
Material	**Ø mm**	**Torque transmission**	**Sleeve**		**Ø 14 mm (M8 x 15)**	**Ø 17 mm (M12 x 20)**
Steel, zinc-plated	40 x 1.5	Without grooves	–	6002 2RZ	1.7W4.JF4.NAE	
		Without grooves	PVC, 5 mm	6002 2RZ	1.7W4.JF5.NAE	
	50 x 1.5	Without grooves	–	6002 2RZ	1.7X4.JAA.NAE	
		Without grooves	PVC, 2 mm	6002 2RZ	1.7X4.J72.NAE	
	60 x 1.5	Without grooves	–	6002 2RZ	1.7Y4.JAB.NAE	
	50 x 1.5	Without grooves	–	6003 2RZ		1.75K.JAA.RAA
	60 x 3.0	Without grooves	–	6003 2RZ		1.75L.J63.RAA

Accessories Overview p 42

Refer to the Planning Section from page p 58 for help with planning and design



UNIVERSAL CONVEYOR ROLLER SERIES 1700

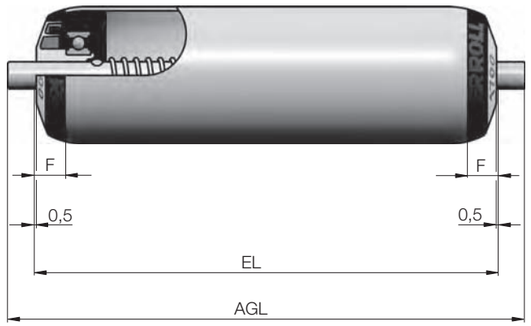
Silent conveyor rollers for heavy-duty loads

Dimensions

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

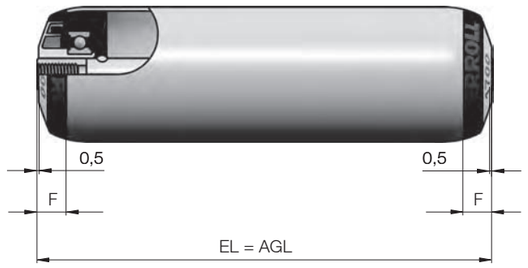
*The reference length/ordering length RL does not have any reference points on the conveyor roller and can therefore not be shown.

Dimensions for spring-loaded shaft version

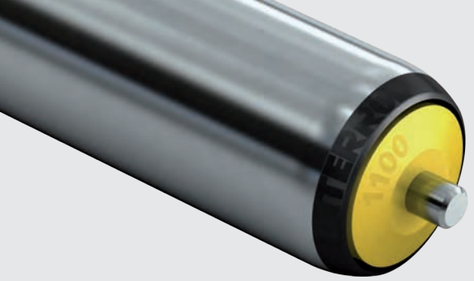


Ø Shaft mm	Ø Tube mm	RL mm	AGL mm	F mm
11 hex	50 / 60	EL - 10	EL + 22	11

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



SMOOTH-RUNNING CONVEYOR ROLLER SERIES 1100

The gravity roller with optimised light start-up

Product Description

Customer benefits

- Cost-effective, corrosion-proof gravity roller
  - Use of stainless steel balls
- Gentle lateral pushing of the materials to be conveyed
  - Rounded tube ends
- Protects the bearing from coarse dirt and liquids
  - Integral water-repellent groove
- Resistant to dirt
  - Smooth surfaces

Applications

- In-house conveyor technology
- Only gravity applications

Properties

- Silent, precise smooth-running roller due to special steel ball bearings and tube made of polypropylene.
- Form-fit join of the bearing housing with the tube above a diameter of 30 mm to avoid slipping of the bearing seat.

Associated platform

- Platform 1100

Technical Data

General technical data	
Max. load capacity	350 N
Max. conveyor speed	0.3 m/s
Temperature range	-5 to +40 °C
Materials	
Bearing housing	Polypropylene
Seal	Polypropylene
Ball	Carbon steel or stainless steel 1.4301

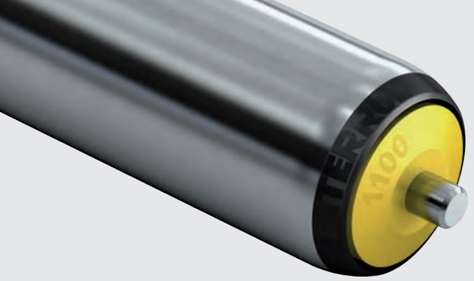
Load capacity

The dynamic load and the surface load are the assumptions for the load capacity. The shaft version can be selected at will.

Tube material	Ø Tube mm	Ø Shaft mm	Max. load capacity in N with an installation length of mm											
			100	200	300	400	500	600	700	800	900	1,000	1,100	1,200
PVC	16 x 1.0	5	33	7	3	2	–	–	–	–	–	–	–	–
	20 x 1.5	6	90	20	10	5	–	–	–	–	–	–	–	–
	30 x 1.8	8	120	100	40	20	15	10	–	–	–	–	–	–
	40 x 2.3	8	180	180	130	70	40	30	–	–	–	–	–	–
Aluminium	20 x 1.5	6	90	90	90	90	85	60	43	–	–	–	–	–

Accessories Overview p 42

Refer to the Planning Section from page p 58 for help with planning and design



SMOOTH-RUNNING CONVEYOR ROLLER SERIES 1100

The gravity roller with optimised light start-up

Standards

Product Selection

Spring-loaded shaft version

Tube		Ball bearing	Shaft		
			Reference number		
Material	Ø mm		Ø 5 mm	Ø 6 mm	Ø 8 mm
PVC	16 x 1.0	Stainless steel	1.1B5.S16.A50		
	20 x 1.5	Standard		1.1AZ.N21.D03	
	20 x 1.5	Stainless steel		1.1AZ.S20.D03	
	30 x 1.8	Standard			1.1DJ.S31.E03
	30 x 1.8	Stainless steel			1.1DK.S31.G03
	40 x 2.3	Standard			1.1DL.S40.E03
	40 x 2.3	Stainless steel			1.1DM.S40.E03
Aluminium, anodised	20 x 1.5	Stainless steel		1.1AZ.A2D.D03	

Ordering example

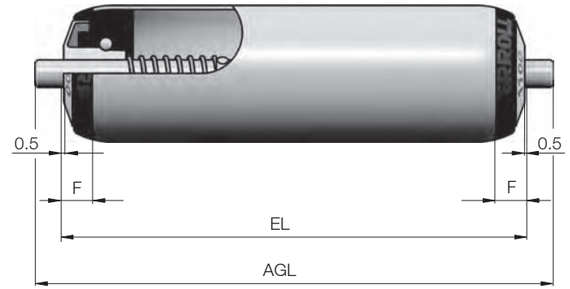
Example of a reference number: 1.1AZ.N21.D03

This reference number is for a Conveyor Roller Series 1100, PVC, Ø tube 20 mm, standard ball bearing, Ø shaft 6 mm, spring-loaded shaft and reference length 490 mm. The reference length RL can be found in the table of dimensions for spring-loaded shafts: RL = EL - 10. The axial play of 0.5 mm per side has already been taken into account. The nominal clearance of your conveyor is 500 mm, which also corresponds to the installation length EL, i. e. the reference length is: 500 - 10 = 490 mm.

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 edges on the conveyor roller and can therefore not be shown.

Dimensions for spring-loaded shaft



Ø Shaft mm	Ø Tube mm	RL mm	AGL mm	F mm
5	16	EL - 5	EL + 12	10.5
6	20	EL - 5	EL + 12	10.5
8	30	EL - 5	EL + 16	8.5
8	40	EL - 5	EL + 16	11

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

ENVIRONMENTAL CONDITIONS

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.

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

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

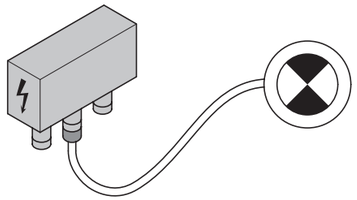
Using a 3-phase 50 Hz motor in a 60 Hz net will increase the frequency and therefore the speed by 20 %. If the rated motor parameters are to be kept constant, a 20 % higher input voltage would be required (law U/f). However, if this 20 % higher voltage is not supplied all voltage-dependent parameters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



ENVIRONMENTAL CONDITIONS

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: 265/480 V – 3ph – 60 – 6, 8, 10 and 12 poles (motor voltage + 15 %)

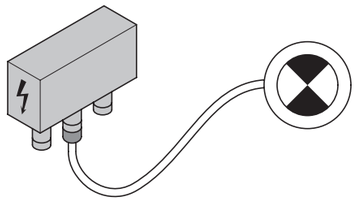
Using a 3-phase 50 Hz motor in a 60 Hz net with 20 % higher voltage will increase the frequency and therefore the speed by 20 % but will maintain all the rated motor parameters subject to small variations (law Uf). Note! However, if the net supply voltage = motor voltage +15 % the actual motor power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



Connecting 3-phase motors to a single phase supply

3-phase motors combined with a frequency converter can be connected to a single phase supply providing that the supply voltage is the same as that of the motor. 3-phase motors generally have a much higher efficiency than single phase motors.

Connecting 1-phase motors to 60 Hz supply

Using 1-phase 50 Hz motors on 60 Hz supply is not generally recommended. The change to 60 Hz with same voltage will affect parameters as shown on 3-phase supply, but with higher risk of overheating and noise increase.

INDUSTRIAL SOLUTIONS

Bottle Recycling

Drum Motors 80S-SMP, 113S-SMP, 80S-SMP DC and 113S DC are suitable for Retail Based Reversed Vending Machines (RBRVM) and associated backroom bottle and can handling equipment.

On request, drum motors can be suited with techno-polymer sprockets for use with modular belting. If applications for narrow belts, handling bottles and cans is required, drum motors can be adapted to this use; either by special brackets or the use of dedicated cassette-systems.

If smaller drive diameter or use of other motor types is required, please contact your Interroll customer consultant.

Supermarket Checkouts

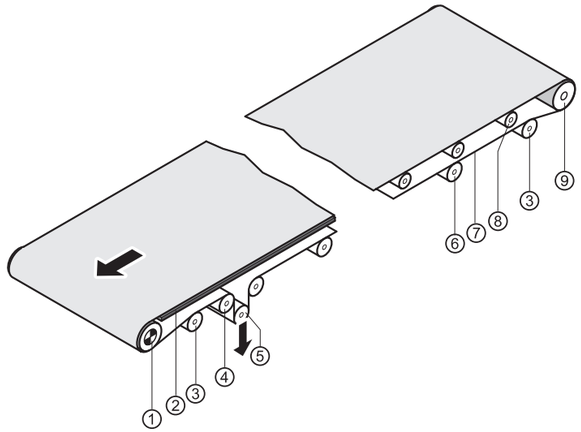
A wide variety of packed foods, confectionery and electrical goods are carried on supermarket checkout conveyors. Frequent start/stops and low noise are typical for this type of application with friction drive belts.

- Plug-in cable connectors
- Primarily single phase supply, 3-phase as an option

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 below.

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. Interroll can supply a belt tensioning measuring device on request.

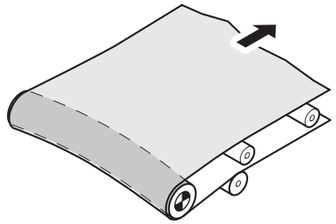


Fig.: Damaged drum motor due to over-tensioning

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
- V-grooves for belt tracking can be machined into the lagging to prevent belt wander

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							
		Steel	Frictioned rubber	PVC, low friction		PVC, high friction		Polyester fabrics	Impregnation with Ropanol
Steel	Dry	0.30	0.25	0.30	0.35	0.40	0.30	0.20	0.25
	Damp	0.25	0.20	0.20	0.25	0.30	0.20	0.15	0.20
Rubber	Dry	0.40	0.30	0.35	0.40	0.50	0.40	0.25	0.30
Grooved rubber	Damp	0.35	0.25	0.25	0.30	0.40	0.30	0.20	0.25
PVC, non-slip	Dry	0.50	0.40	0.41	0.50	0.60	0.45	0.35	0.40
	Damp	0.35	0.35	0.30	0.35	0.40	0.40	0.25	0.30
Ceramics	Dry	0.55	0.35	0.30	0.35	0.40	0.40	0.25	0.30
	Damp	0.45	0.35	0.30	0.35	0.40	0.40	0.25	0.30

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.

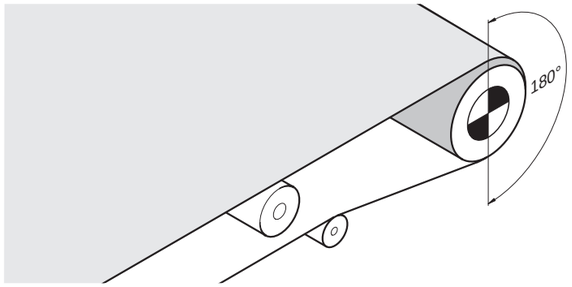


Fig.: Minimum belt wrap angle for friction drive belt conveyors

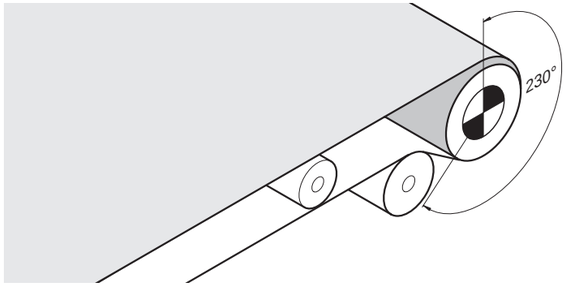


Fig.: Increased belt wrap angle for friction drive belt conveyors

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.

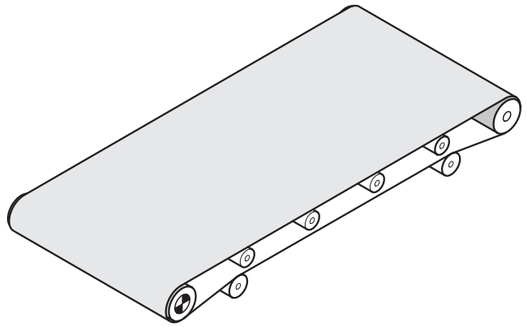


Fig.: Roller bed conveyor

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.

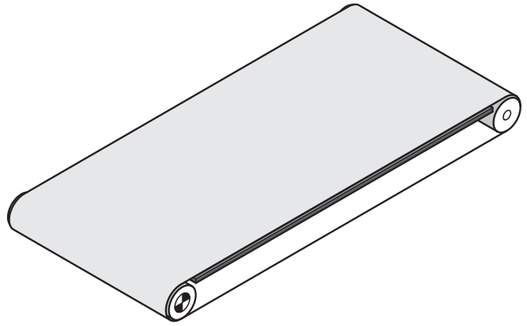


Fig.: Slide bed conveyor

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.

DESIGN GUIDELINES

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.

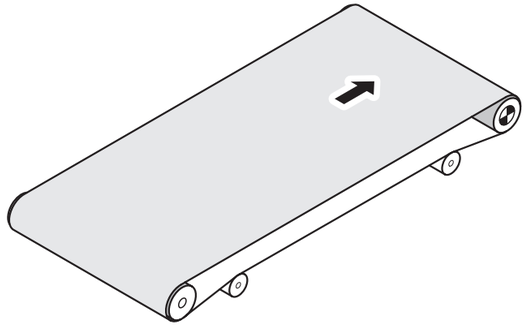


Fig.: Non-reversible conveyor with head drive

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).

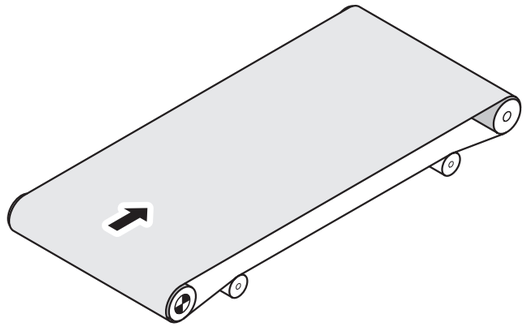
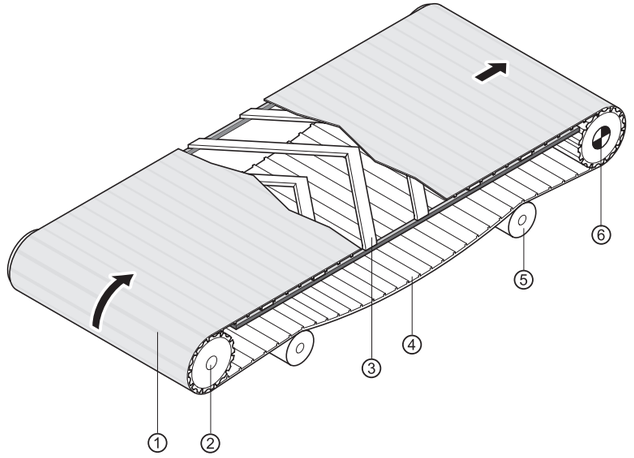


Fig.: Short friction drive belt conveyor with tail drive

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 converter optimised for cool-running. Alternatively a cool-running drum motor can be used.

Examples of positive driven belts include the following:

- Plastic modular belts
- Thermoplastic non-modular belts
- Steel slatted belts
- Steel 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.

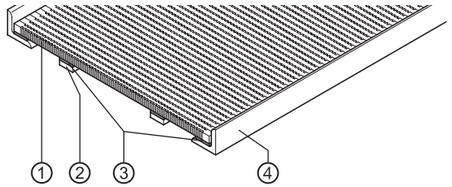


Fig.: Belt guides

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.

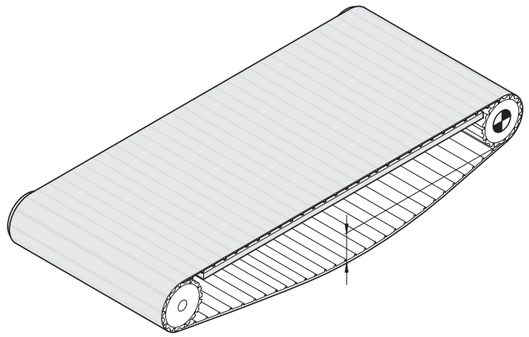


Fig.: Short conveyor without support rollers on the return belt

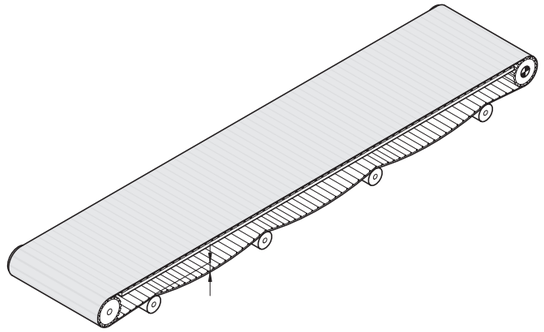


Fig.: Medium and long conveyor with catenary sags and support rollers on the return belt

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 V_f can be found in the option section.

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

V_{belt}: Speed of the belt

V_{dm}: Rated speed of the drum motor

V_f: 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 converter 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 / V_f

Drive positions

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

DESIGN GUIDELINES

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.

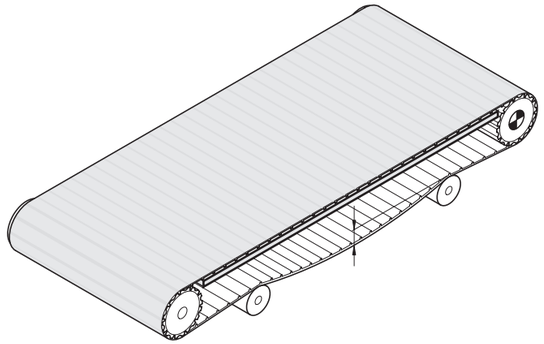


Fig.: Head drive for positive drive belt conveyors

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.

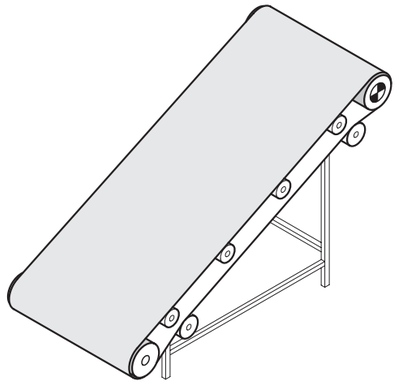


Fig.: Inclined conveyor

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.

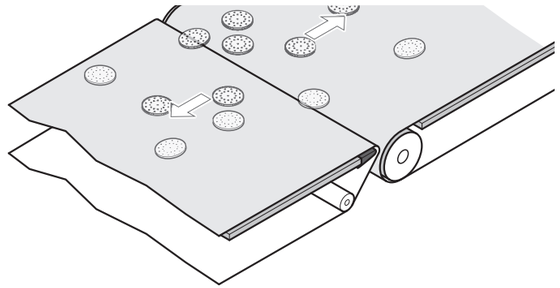


Fig.: Knife-edge conveyor

DESIGN GUIDELINES

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 76)

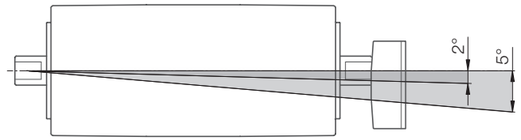
Frequent starts and stops

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 converter 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.

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 80S-SMP drum motors must be mounted within ±5° of the horizontal. 113S-SMP, 80C and 113C 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.

- Carton turning
- Plough transfer units
- Deflector conveyors

Correct orientation of drum motor shaft for horizontal mounting

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

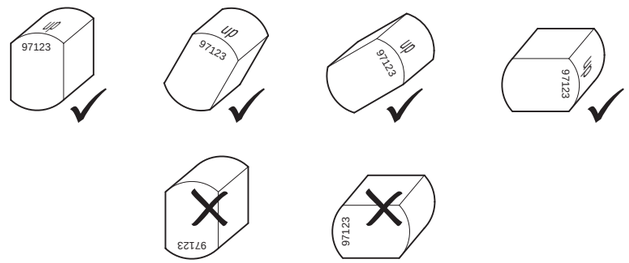


Fig.: Mounting orientation of drum motor shaft

Drum motors 80S-SMP and 113S-SMP can be mounted in any orientation.

DESIGN GUIDELINES

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 44.

Axial play

The axial play between the shaft key flats and the bracket must be not more than 0.4 mm.

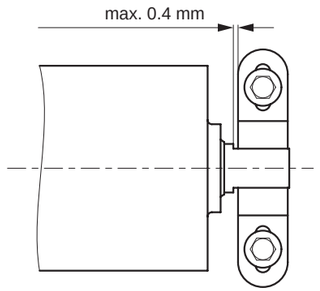


Fig.: Maximum axial play

Torsion play

The torsion play between the shaft key flats and the mounting bracket must be not more than 0.4 mm.

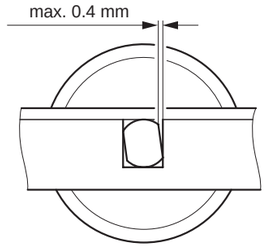


Fig.: Maximum torsion play

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.

Supported length

At least 80 % of the shaft key flat length must be supported by the mounting bracket.

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 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.

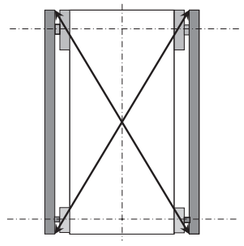


Fig.: Diagonal check

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.

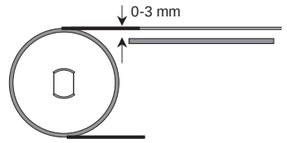
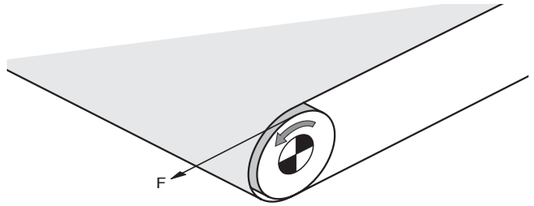


Fig.: Maximum distance between belt and conveyor bed

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.

Belt Pull

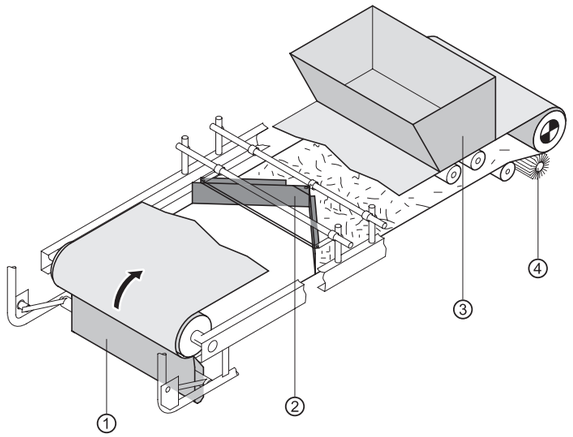
The rated belt pull, power and speed for each drum motor version are shown in this catalogue.



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

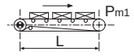
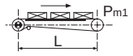
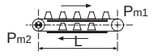


1 Scraper
2 Plough
3 Hopper
4 Brush

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

Accumulation

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.

CALCULATION GUIDE AND SELECTION

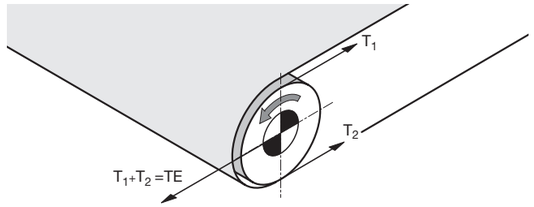
Coefficient of friction:

	Slide bed material C_2, C_4		Product material C_1, C_3		
Belt material	**PE**	**Steel**	**Steel**	**Glass, techno-polymer**	**Techno-polymer**
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

Take into account the following points when calculating the belt tension:

- Consider the length and width of the conveyor belt
- Consider the belt type and 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 1 %. So that the belt elongation is max. 1 % 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. Always use a belt tension measuring instrument during installation.

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. Drum motor diameters that are too small could lead to the belt becoming damaged.

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.

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.

Single Phase 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 has to be switched parallel to the running capacitor. 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 and starting 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 converter. 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 converter.

Final Steps

Please conclude your selection after considering the following:

- 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 converter and choose the motor version with the closest speed or contact Interroll
- Choosing a drum motor version with least number of poles and least amount of gear stages can reduce the purchase price of the unit
- Use the drum motor configurator to validate your selection (see fold-out page)

MATERIAL SPECIFICATION

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 V50 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 and 1-phase / 115 V / 60 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 or brush type 24 V DC.

Alternative voltage

- Drum motors for alternative voltages are available on request
- S and C-series drum motors are normally supplied with one voltage option.
-

3-phase motors

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

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 (ambient temperatures over + °C) occurs in the motor causing the stator winding to overheat, the switch will open at a pre-determined temperature (standard 130) and interrupt the power supply.
If the thermal protector is not connected, as described above, the warranty will be invalidated. Please contact Interroll if you wish to use other types of thermal winding protection.

For 80C and special 113C drum motors standard protection is with the thermal in series with the winding, for example selfprotected motors.

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

Optimum protection

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	X5CrNi18-10

End Housing and Shaft Caps

Interroll Drum Motors are supplied with pressed and glued end housings. End housings and shaft caps are manufactured from sea water-resistant aluminium.

MATERIAL SPECIFICATION

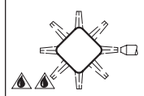
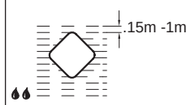
Sealing System

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

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 for supermarkets are provided with IP64 protection as standard.

Protection against solid bodies			Protection of internal equipment against harmful ingress of water		
Symbol	**IP, first number**	**Definition**	**Symbol**	**IP, second number**	**Definition**
	5	Dust-protected		4	Protected against spray water
	6	Dust-tight		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 (30 min.) immersed 1 metre in water under standardised conditions of pressure and time.

CONNECTION DIAGRAMS

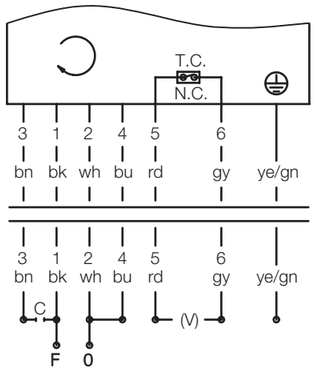
Abbreviations

Explanation of abbreviations:		
TC: Thermal control	1~: 1-phase motor	Cr: Capacitor run
BR: Electromagnetic brake	3~: 3-phase motor	Cs: Capacitor start
NC: not connected		
rd: red	gy: grey	wh: white
ye: yellow	gn: green	or: orange
bu: blue	bn: brown	vi: violet
bk: black	pk: pink	( ): alternative colour

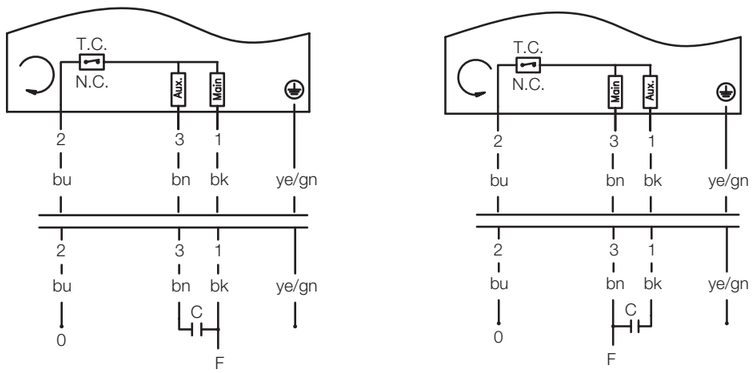
Rotation

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.

Connection Diagram for Interroll Drum Motors 80C, 113C Standard



Connection Diagram for Interroll Drum Motors 80C, 113C Optional



Connection Diagrams for Interroll Drum Motors 80S-SMP, 113S-SMP

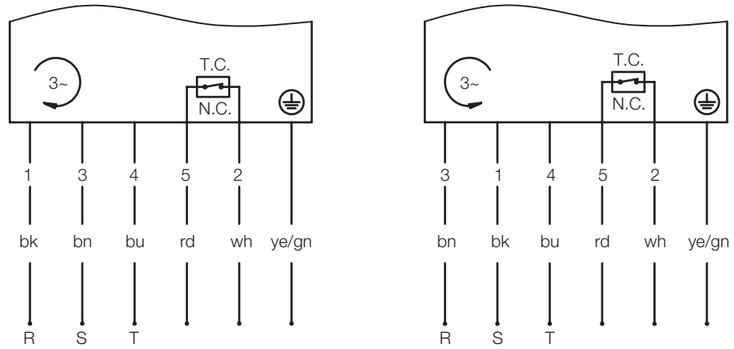


Fig.: 3-phase operation, 6 lead cable

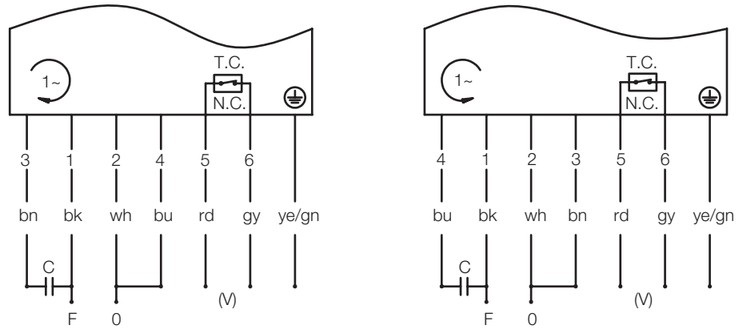
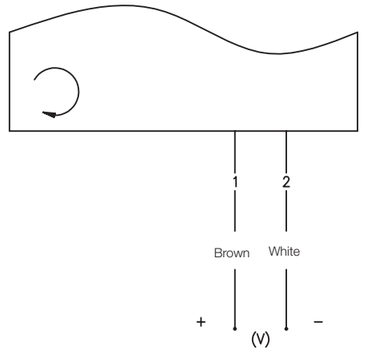


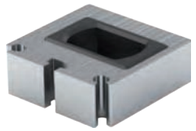
Fig.: 1-phase operation, 7 lead cable

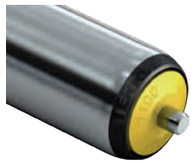
Connection Diagram for Interroll Drum Motors 80S DC, 113S DC



Note: For CCW rotation interchange brown (1) and white (2).

ACCESSORIES

Anti-vibration Bracket			*see page 44*
	Anti-vibration Bracket (including rubber insert)		**S1DGU8**
	Rubber		**S1DGP6**
Conveyor Roller Series 1450			*see page 48*
	Steel, bright		**1.88J.B6S.S6D RL: _____**
	Steel, galvanised		**1.88J.J6S.S6D RL: _____**
Universal Conveyor Roller Series 1700			*see page 50*
	**Ø mm**	**Sleeve**	**11 mm hex**
	40 x 1.5	PVC, 5 mm	**1.7W5.JF5.VAB RL: _____**
		–	**1.7W5.JF4.VAB**
	50 x 1.5	PVC, 2 mm	**1.7X5.J72.VAB**
		–	**1.7X5.JAA.VAB**
	60 x 1.5	–	**1.7Y5.JAB.VAB**

	**Ø mm**	**Sleeve**	**Ø 14 mm**	**Ø 17 mm**
	40 x 1.5	PVC, 5 mm	**1.7W4.JF5.NAE**	
		–	**1.7W4.JF4.NAE**	
	50 x 1.5	PVC, 2 mm	**1.7X4.J72.NAE**	
		–	**1.7X4.JAA.NAE**	
	60 x 1.5	–	**1.7Y4.JAB.NAE**	
	50 x 1.5	–		**1.75K.JAA.RAA**
	60 x 3.0	–		**1.75L.J63.RAA**
Smooth-running Conveyor Roller Series 1100			*see page 54*	
	**Ø mm**	**Material**	**Ø 6 mm**	**Ø 8 mm**
	20 x 1.5	PVC	**1.1AZ.N21.D03**	
	30 x 1.8	PVC		**1.1DJ.S31.E03**
	40 x 2.3	PVC		**1.1DL.S40.E03**

Please see page 56 for more variants

CONFIGURATOR

Drum Motor			
Required delivery time	___ /___ /____		
Quantity	_____		
Application	○ Type of industry: _____		
Motor Data			
Motor type	○ 80C ○ 80S-SMP ○ 80S DC ○ 113C ○ 113S-SMP ○ 113S DC		
Rated power	_____ kW		
Rated speed	_____ m/s at 50 Hz		
Rated voltage	○ 230 V ○ 400 V ○ Other: ____ V		
Frequency	○ 50 Hz ○ 60 Hz		
Versions			
Length	SL: _____ mm	EL: _____ mm	AGL: _____ mm
Cable length	○ 1 m ○ 3 m ○ 5 m ○ Other lenghts: ___ m		
External connectors	○ Type: _____		
Certifications	✓ CE	○ UL approved	
Idler Pulley			
Quantity	_____		
Diameter	_____ mm	○ Crowned	○ Cylindrical
Length	SL: _____ mm	EL: _____ mm	AGL: _____ mm
Cassette			
Length	C/C length _____ mm		
EL length	○ EL: ____ mm		
Cassette type	○ U-Type: _____	○ L-Type: _____	
Ø Drive	○ 80 mm	○ 113 mm	
Ø Idler pulley	○ 50 mm	○ Other: _____ mm	
Required belt speed	_____ m/s		
Load on the cassette	_____ kg		
Voltage	_____ V		
Frequency	○ 50 Hz	○ 60 Hz	
Drum motor belt adjustment	○ Left	○ Right	
Accumulation on cassette	○ Yes	○ No	
Belt type (if not standard)	_____		
Quantity	_____		
Notes, special requirements:	_____		
Accessories *(see page on left hand)*			
Quantity, reference number	___ _____		
	___ _____		
	___ _____		

INTERROLL – CORPORATE ART

Art has a positive influence on the work environment and the internal processes governing these structures. Interroll Corporate Art is to channel this creative potential to create a dialogue that embraces art and business as vehicles of communication and to establish an environment in which the spirit of thought is allowed to flourish.

He lives in dreams. He loves the dark arts and arising out of the unconscious. All this is what Steffen Geisler represents in grandiose spatial art with theatre-like installations and bold imagery.

This Berlin artist allowed his unusual works to convert the familiar into the alien and the alien into the familiar when his art was exhibited at Interroll‘s Swiss headquarters in Sant‘Antonino – thus, he provokes. To think about – to rethink – to consider in advance. He stimulates the explorer‘s spirit and challenges toward innovative creativity. Exactly into that which turns even good conveyor technology into something decisively better.

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INSPIRED BY EFFICIENCY

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