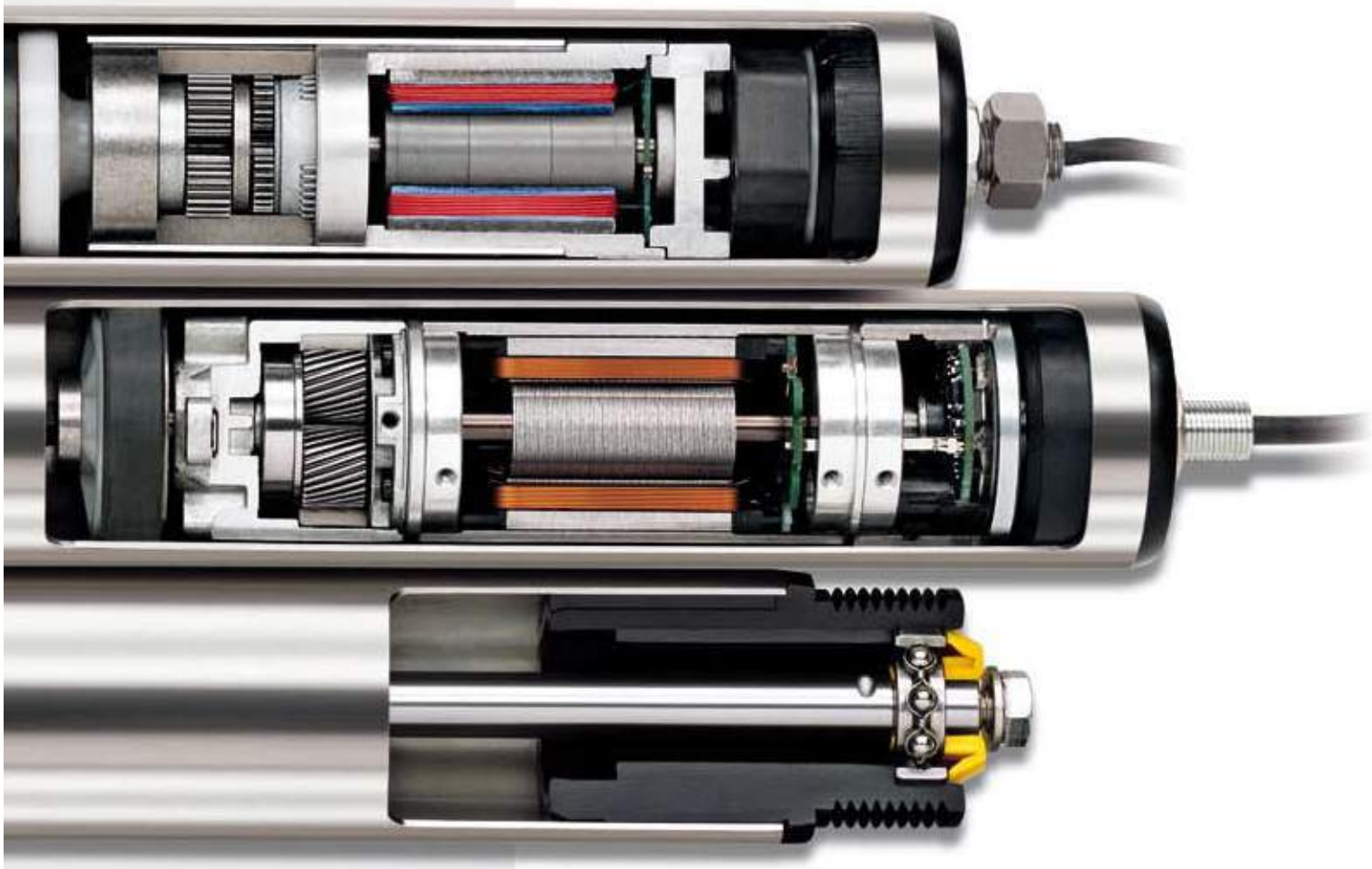
en-US DEC / 2008

INTERROLL

WE MAKE THE WORLD MOVE



ROLLER-DRIVES AND DRIVECONTROL®

WWW.INTERROLL.COM

INTERROLL CORPORATE ART

ROLLERDRIVES & DRIVECONTROLS® en-US DEC / 2008

PROVEN WORLDWIDE:

CORE PRODUCTS OF INTERROLL DRIVES & ROLLERS

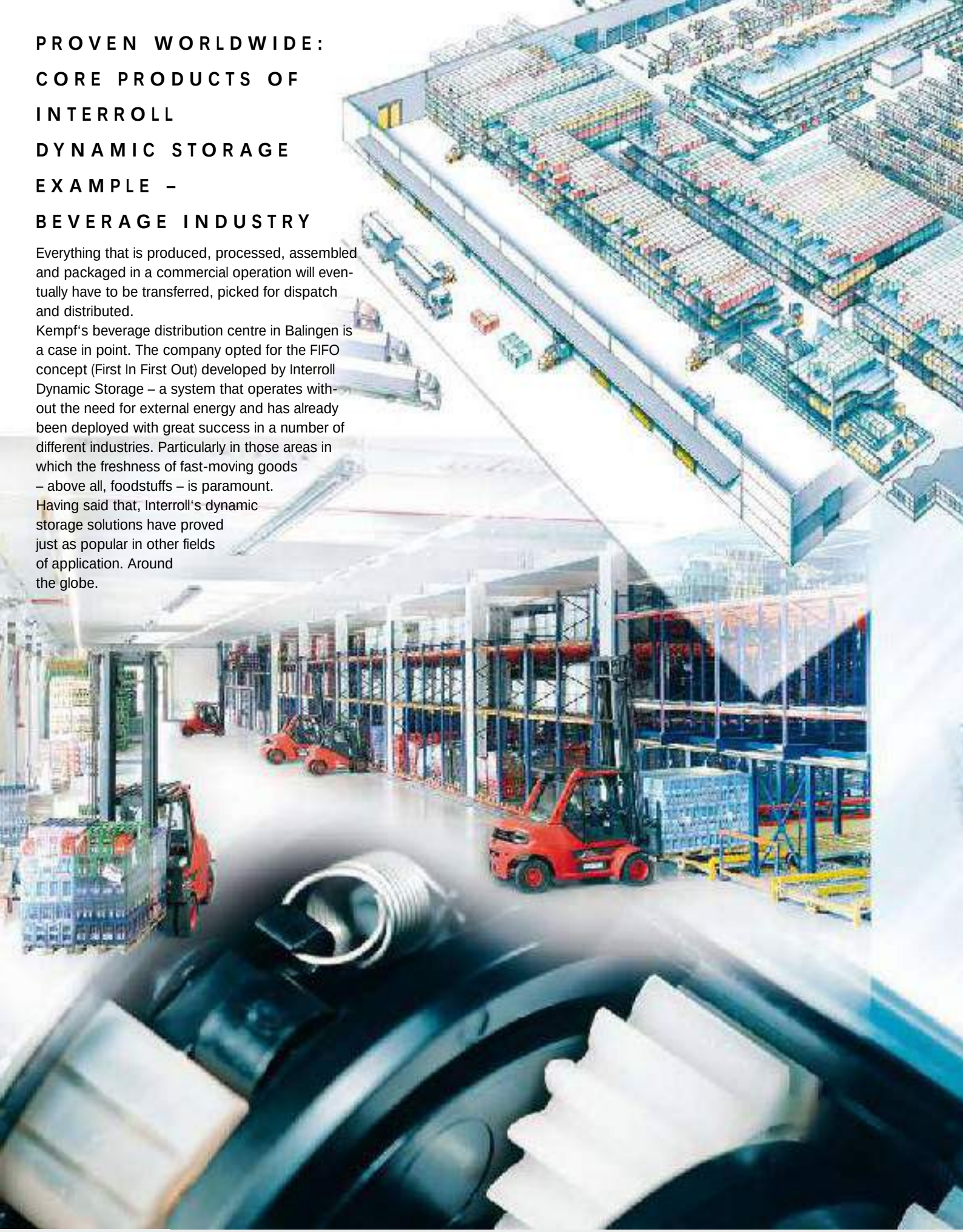
EXAMPLE – FOOD INDUSTRY

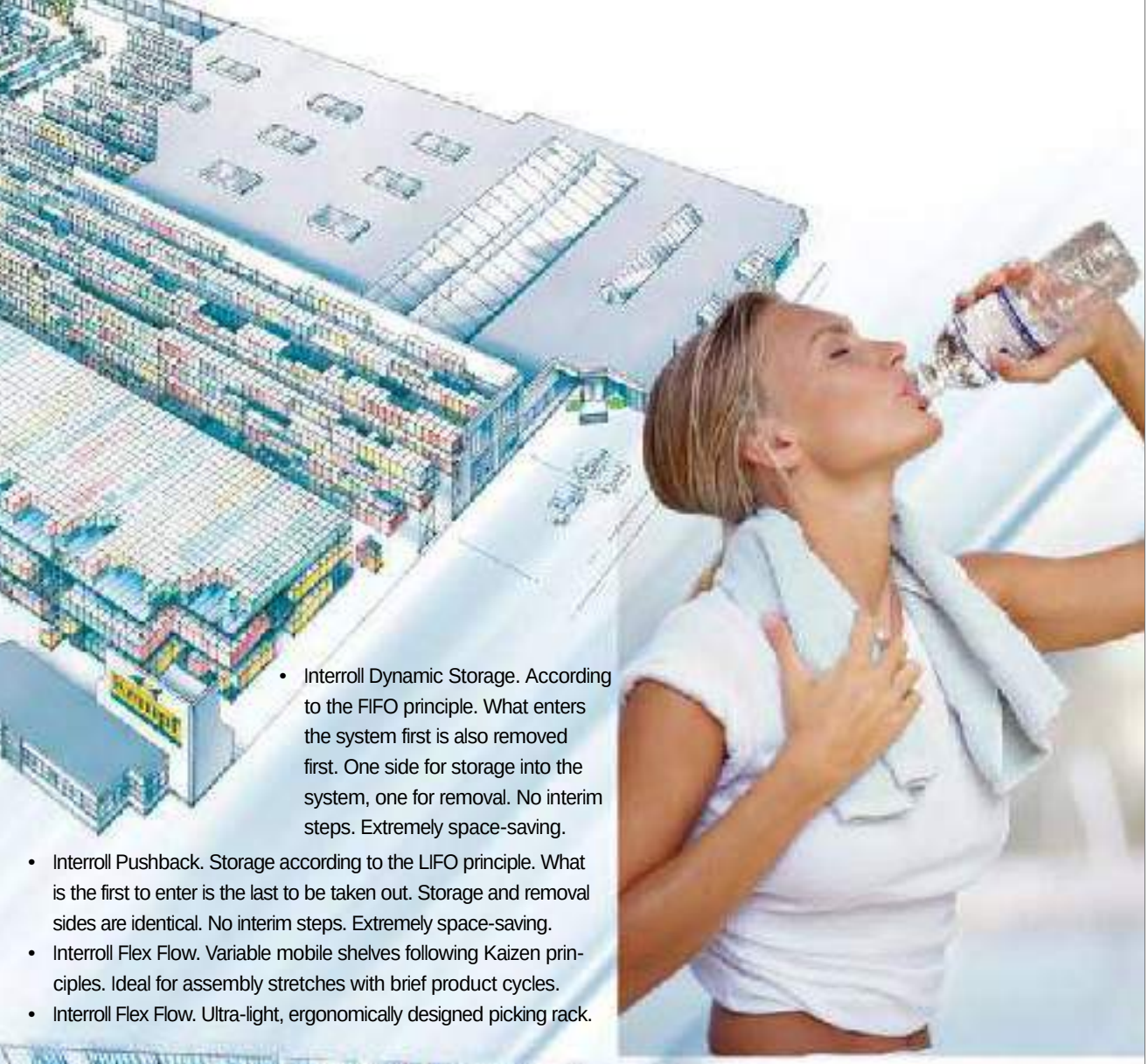
Who even thinks of why for example aromatic strawberries or juicy steaks are delivered fresh every day. What is seemingly a matter of course is, behind the curtains, a masterpiece performance in logistics. Add to that, the route from the producer to the user is blanketed with a string of hygiene-related regulations. Thus it goes without saying that conveyor related drives and components are subjected to the highest demands. Interroll products supremely master what is required of them. Around the clock. Around the world.

- Interroll Drives & Rollers keeps foodstuffs on the move by supplying state-of-the-art Drum Motors, Conveyor Rollers and RollerDrives.
- Intelligent components and controls allow Interroll Drives & Rollers to individually conduct each workflow.
- Interroll Drives & Rollers ensures hygienic handling and intense high pressure cleaning with hermetically sealed function units.
- Interroll Drives & Rollers meets the most stringent requirements with premium-quality materials made of stainless steel and technopolymers.
- Interroll Drives & Rollers offers tangible operational benefits thanks to no-maintenance designs and fast, simple installation.
- Interroll Drives & Rollers delivers peace of mind, drawing on fifty years of experience in intralogistics and a service network that spans the globe.

PROVEN WORLDWIDE: CORE PRODUCTS OF INTERROLL DYNAMIC STORAGE EXAMPLE – BEVERAGE INDUSTRY

Everything that is produced, processed, assembled and packaged in a commercial operation will eventually have to be transferred, picked for dispatch and distributed.
Kempf's beverage distribution centre in Balingen is a case in point. The company opted for the FIFO concept (First In First Out) developed by Interroll Dynamic Storage – a system that operates without the need for external energy and has already been deployed with great success in a number of different industries. Particularly in those areas in which the freshness of fast-moving goods – above all, foodstuffs – is paramount.
Having said that, Interroll's dynamic storage solutions have proved just as popular in other fields of application. Around the globe.





- Interroll Dynamic Storage. According to the FIFO principle. What enters the system first is also removed first. One side for storage into the system, one for removal. No interim steps. Extremely space-saving.
- Interroll Pushback. Storage according to the LIFO principle. What is the first to enter is the last to be taken out. Storage and removal sides are identical. No interim steps. Extremely space-saving.
- Interroll Flex Flow. Variable mobile shelves following Kaizen principles. Ideal for assembly stretches with brief product cycles.
- Interroll Flex Flow. Ultra-light, ergonomically designed picking rack.

PROVEN WORLDWIDE:
CORE PRODUCTS OF INTERROLL AUTOMATION
EXAMPLE – POSTAL SERVICES

Logistics and distribution are among the most rapidly evolving disciplines in today‘s fast-track business arena. Little wonder, given the millions of deliveries made each day around the globe. Individually picked, each item has to arrive at the right time and the right place. Here at the Swiss Post distribution centre in Zürich-Mülligen four state-of-the-art Interroll Crossbelt Sorters help ensure that letters always find their destination. Two of them are deployed at the incoming unit and the picking station, where they sort up to 10,000 mail totes per hour. Around the clock. Thanks to Interroll‘s cutting-edge Crossbelt Sorters, distribution centres can always play it safe. Technically and financially.

- Interroll Automation has established a close rapport with global system integrators, equipment manufacturers/ OEMs, technical consultants and intralogistics specialists as well as operators of distribution centres and sortation systems, providing expert advice on strategic matters, project planning and engineering.
- Interroll Automation develops, produces and markets subsystems and conveyor modules such as Crossbelt Sorters, Merges, Belt Curves, Belt Conveyors and Intelliveyor Roller Conveyor Modules for efficient unit-load handling with zero-pressure accumulation.
- Interroll Automation guarantees fast delivery of pre-assembled modules and global availability at all times, as well as offering installation assistance, excellent consulting services for complex projects and a solid partnership centred around a financially sound company.

- Mechanical performance 31 W
- Roller diameter 1.9 in
- Max. length RL 59 in
- External commutation electronics
- 8 gear ratios
- 15,000 hours minimal life time
- Protection rate IP54

- Noise 55 dB(A), mounted in a conveyor frame
- After run reducing motor stop function
- Electronic brake for holding the motor (Zero Motion Hold)
- Motor cable with 8 pole Tyco connector

Article number: see fold-out page

Motor shaft		Idler shaft								Length
HEX1	HEX0	Straight		Groove 1.25/1.76		O-ring hub		PolyVee hub		Min. RL
		F01	H01	F01	H01	F02	H02	F03	H03	[in]
•	•	•								9.82
			•							11.27
				•						12.14
					•					12.14
						•				11.79
							•			12.22
								•		11.79
									•	12.22
•	•	•								10.27
			•							11.27
				•						12.59
					•					12.59
						•				12.24
							•			12.67
								•		12.24
									•	12.67
•	•	•								10.12
			•							11.57
				•						12.44
					•					12.44
						•				12.08
							•			12.51
								•		12.08
									•	12.51
•	•	•								10.12
			•							11.57
				•						12.44
					•					12.44
						•				12.08
							•			12.51
								•		12.08
									•	12.51
•	•	•								10.12
			•							11.57
				•						12.44
					•					12.44
						•				12.08
							•			12.51
								•		12.08
									•	12.51

Legend:

i	Gear ratio
v	Speed of transport
M_N	Nominal torque
M_A	Peak torque
HEX0	7/16 in, solid hexagonal
HEX1	M12 x 1.5 7/16 in, hexagonal
H01	7/16 in, HEX spring loaded
H02	7/16 in, HEX spring loaded, O-ring
H03	7/16 in, spring loaded, PolyVee
F01	Female 5/16 in, floating
F02	Female 5/16 in, floating dual bearing
F03	Female 5/16 in, floating, PolyVee

Technical Specifications - p. 60

ROLLERDRIVE EC110

Characteristics				Tube material		Shaft material		Tube sleeving		Motor cable
i	v [fpm]	M_N [in-lbf]	M_A [in-lbf]	Steel Zinc plated	Stainless	Steel Zinc plated	Stainless	PVC 0.08 in	PU 1/8 in	Length 39.37 in
36	53	26.5	81.0	•	•	•	•	•	•	•
48	40	30.0	102.0	•	•	•	•	•	•	•
64	30	37.6	117.0	•	•	•	•	•	•	•

RollerDrives
Overview - p. 14

ZoneControl
HC-EC110 - p. 58

- Mechanical performance 31 W
- Roller diameter 1.9 in
- Max. length RL 59 in
- External commutation electronics
- 8 gear ratios
- 15,000 hours minimal life time
- Protection rate IP54

- Noise 55 dB(A), mounted in a conveyor frame
- After run reducing motor stop function
- Electronic brake for holding the motor (Zero Motion Hold)
- Motor cable with 8 pole Tyco connector

Article number: see fold-out page

Motor shaft		Idler shaft								Length
HEX1	HEX0	Straight		Groove 1.25/1.76		O-ring hub		PolyVee hub		Min. RL
		F01	H01	F01	H01	F02	H02	F03	H03	[in]
•	•	•								10.57
			•							12.02
				•						12.89
					•					12.89
						•				12.54
							•			12.96
								•		12.54
									•	12.96
•	•	•								10.57
			•							12.02
				•						12.89
					•					12.89
						•				12.54
							•			12.96
								•		12.54
									•	12.96
•	•	•								10.57
			•							12.02
				•						12.89
					•					12.89
						•				12.54
							•			12.96
								•		12.54
									•	12.96

Legend:

i	Gear ratio
v	Speed of transport
M_N	Nominal torque
M_A	Peak torque
HEX0	7/16 in, solid hexagonal
HEX1	M12 x 1.5 7/16 in, hexagonal
H01	7/16 in, HEX spring loaded
H02	7/16 in, HEX spring loaded, O-ring
H03	7/16 in, spring loaded, PolyVee
F01	Female 5/16 in, floating
F02	Female 5/16 in, floating dual bearing
F03	Female 5/16 in, floating, PolyVee

Technical Specifications - p. 60

ROLLERDRIVE EC110

Technical data

Nominal voltage [V DC]	24
Voltage range [V DC]	22 to 28
No load current [A]	0.6
Continuous current [A]	2.5
Peak current [A]	4.1
System efficiency [%]	52
Maximum permissible ripple from power supply [%]	5
Noise [dB(A)]	55
Ambient temperature for operation [°F]	32 to 104
Ambient temperature for transport and storage [°F]	-4 to 167
Ambient temperature changes [K/min]	max. 1 °K/min; 3 h; two cycles according to IEC 68-2-14
Max. ambient humidity [%]	90, not condensing

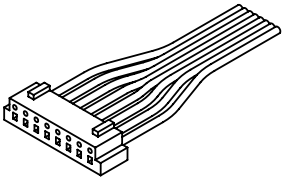
Maximum static load

Maximum static load per RollerDrive

RL [in]	Max. static load [lbs]
12 to 30	450
31 to 39	250
40 to 59	110

Motor plug

The motor plug is manufactured by AMP, consisting of a plug (AMP-part # 175778-8) and terminal pins (AMP-part # 1-175102-1). In case of ripped out cables the plug can be repaired using a crimping tool available directly from AMP (part # 9184381).



Color	Lead	Description
Black	Phase C	Motor leads with AWG 22
White	Phase B	
Red	Phase A	
Yellow	S3 (C)	Hall effects sensor leads with AWG 22
Orange	S2 (B)	
Brown	S1 (A)	
Blue	4.5 to 20.0 V DC	
Green	Ground	

Accessories

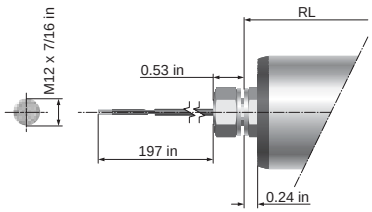
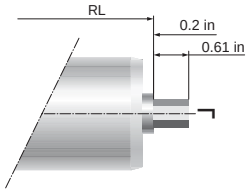
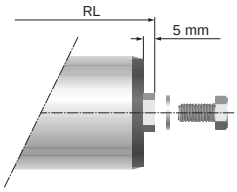
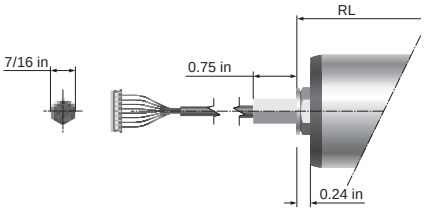
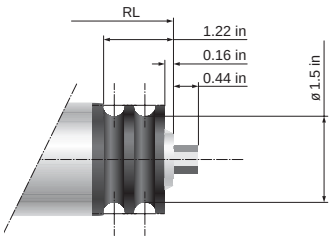
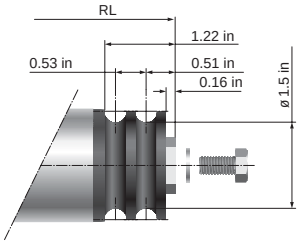
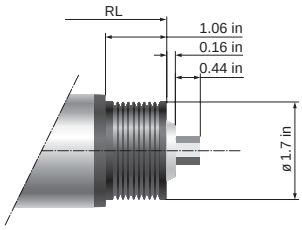
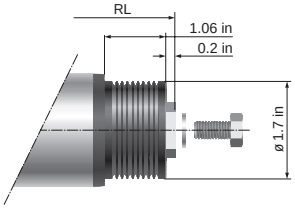
Part	Characteristics	Article number
Anti-spin bracket flat up	Bottom and top of hex are flat	N582 - see p. 68
Anti-spin bracket point up	Bottom and top of hex are pointed	N583 - see p. 68

- Mechanical performance 31 W
- Roller diameter 1.9 in
- Max. length RL 59 in
- External commutation electronics
- 8 gear ratios
- 15,000 hours minimal life time
- Protection rate IP54

- Noise 55 dB(A), mounted in a conveyor frame
- After run reducing motor stop function
- Electronic brake for holding the motor (Zero Motion Hold)
- Motor cable with 8 pole Tyco connector

Article number: see fold-out page

Shaft executions

Motor shaft	Idler shaft	
	7/16 in hex, spring-loaded	**Female threaded 5/16 in, floating**
	straight	
HEX1	H01	F01
		
	O-ring hub	
HEX0	H02	F02
		
	PolyVee hub	
	H03	F03
		

Curves

For curve applications there are tapered RollerDrives and Rollers. For further information see “Technical specifications“, page 66.

ROLLERDRIVE EC100 B

Characteristics				Tube material		Shaft material		Tube sleeving		Motor cable
i	v [fpm]	M_N [in-lbf]	M_A [in-lbf]	Steel Zinc plated	Stainless	Steel Zinc plated	Stainless	PVC 0.08 in	PU 1/8 in	Length 30 in
12	260	3.3	8.9 - 12.0	•	•	•	•	•	•	•
16	202	4.2	13.3 - 16.0	•	•	•	•	•	•	•
24	135	6.6	19.5 - 25.0	•	•	•	•	•	•	•
36	88	10.4	26.6 - 34.0	•	•	•	•	•	•	•
48	68	11.0	35.4 - 44.0	•	•	•	•	•	•	•

- Mechanical performance 18 W
- Roller diameter 1.9 in
- Max. length RL 59 in
- External commutation electronics
- 7 gear ratios
- 15,000 hours minimal life time
- Protection rate IP54
- Noise 55 dB(A), mounted in a conveyor frame
- After run reducing motor stop function
- Electronic brake for holding the motor (Zero Motion Hold)
- Mechanical failsafe brake
- Motor cable with 8 pole Tyco connector

Article number: see fold-out page

Motor shaft	Idler shaft								Length
HEX1	Straight		Groove 1.25/1.76		O-ring hub		PolyVee hub		Min. RL
	F01	H01	F01	H01	F02	H02	F03	H03	[in]
•	•								9.61
		•							11.06
			•						11.93
				•					11.93
					•				11.58
						•			12.01
							•		11.58
								•	12.01
•	•								9.61
		•							11.06
			•						11.93
				•					11.93
					•				11.58
						•			12.01
							•		11.58
								•	12.01
•	•								9.61
		•							11.06
			•						11.93
				•					11.93
					•				11.58
						•			12.01
							•		11.58
								•	12.01
•	•								10.05
		•							11.50
			•						12.37
				•					12.37
					•				12.02
						•			12.45
							•		12.02
								•	12.45
•	•								10.05
		•							11.50
			•						12.37
				•					12.37
					•				12.02
						•			12.45
							•		12.02
								•	12.45

Legend:

i	Gear ratio
v	Speed of transport
M_N	Nominal torque
M_A	Peak torque
HEX1	M12 x 1.5 7/16 in, hexagonal
H01	7/16 in, HEX spring loaded
H02	7/16 in, HEX spring loaded, O-ring
H03	7/16 in, spring loaded PolyVee
F01	Female 5/16 in, floating
F02	Female 5/16 in, floating dual bearing
F03	Female 5/16 in, floating, PolyVee

Technical Specifications - p. 60

ROLLERDRIVE EC100 B

Characteristics				Tube material		Shaft material		Tube sleeving		Motor cable
i	v [fpm]	M_N [in-lbf]	M_A [in-lbf]	Steel Zinc plated	Stainless	Steel Zinc plated	Stainless	PVC 0.08 in	PU 1/8 in	Length 30 in
64	50	16.1	46.0 - 54.0	•	•	•	•	•	•	•
96	34	26.6	86.7 - 100.0	•	•	•	•	•	•	•

- Mechanical performance 18 W
- Roller diameter 1.9 in
- Max. length RL 59 in
- External commutation electronics
- 7 gear ratios
- 15,000 hours minimal life time
- Protection rate IP54

- Noise 55 dB(A), mounted in a conveyor frame
- After run reducing motor stop function
- Electronic brake for holding the motor (Zero Motion Hold)
- Mechanical failsafe brake
- Motor cable with 8 pole Tyco connector

Article number: see fold-out page

Motor shaft	Idler shaft								Length
HEX1	Straight		Groove 1.25/1.76		O-ring hub		PolyVee hub		Min. RL
	F01	H01	F01	H01	F02	H02	F03	H03	[in]
•	•								10.05
		•							11.50
			•						12.37
				•					12.37
					•				12.02
						•			12.45
							•		12.02
								•	12.45
•	•								10.05
		•							11.50
			•						12.37
				•					12.37
					•				12.02
						•			12.45
							•		12.02
								•	12.45

Legend:

i	Gear ratio
v	Speed of transport
M_N	Nominal torque
M_A	Peak torque
HEX1	M12 x 1.5 7/16 in, hexagonal
H01	7/16 in, HEX spring loaded
H02	7/16 in HEX spring loaded, O-ring
H03	7/16 in, spring loaded PolyVee
F01	Female 5/16 in, floating
F02	Female 5/16 in, floating dual bearing
F03	Female 5/16 in, floating, PolyVee

Technical Specifications - p. 60

ROLLERDRIVE EC100 B

Technical data

Nominal voltage [V DC]	24
Voltage range [V DC]	22 to 28
No load current [A]	0.6
Continuous current [A]	1.8
Peak current [A]	4.1
System efficiency [%]	52
Maximum permissible ripple from power supply [%]	5
Noise [dB(A)]	55
Ambient temperature for operation [°F]	32 to 104
Ambient temperature for transport and storage [°F]	-4 to 167
Ambient temperature changes [K/min]	max. 1 °K/min; 3 h; two cycles according to IEC 68-2-14
Max. ambient humidity [%]	90, not condensing

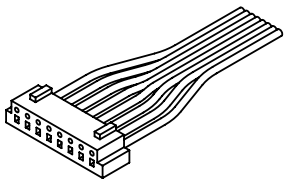
Maximum static load

Maximum static load per RollerDrive

RL [in]	Max. static load [lbs]
12 to 30	450
31 to 39	250
40 to 59	110

Motor plug

The motor plug is manufactured by AMP, consisting of a plug (AMP-part # 175778-8) and terminal pins (AMP-part # 1-175102-1). In case of ripped out cables the plug can be repaired using a crimping tool available directly from AMP (part # 9184381).



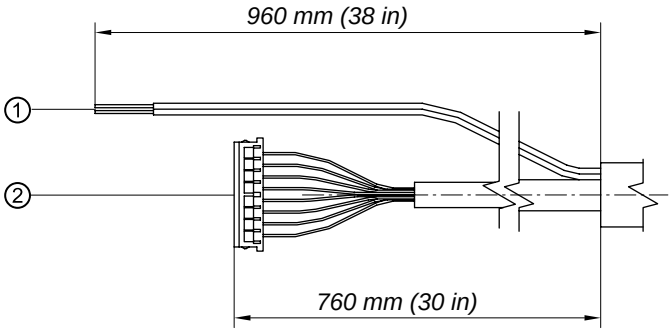
Color	Lead	Description
Black	Phase C	Motor leads with AWG 22)
White	Phase B	
Red	Phase A	
Yellow	S3 (C)	Hall effects sensor leads with AWG 26
Orange	S2 (B)	
Brown	S1 (A)	
Blue	4.5 to 20.0 V DC	
Green	Ground	

- Mechanical performance 18 W
- Roller diameter 1.9 in
- Max. length RL 59 in
- External commutation electronics
- 7 gear ratios
- 15,000 hours minimal life time
- Protection rate IP54
- Noise 55 dB(A), mounted in a conveyor frame
- After run reducing motor stop function
- Electronic brake for holding the motor (Zero Motion Hold)
- Mechanical failsafe brake
- Motor cable with 8 pole Tyco connector

Article number: see fold-out page

Failsafe brake

The failsafe brake is designed to hold the RollerDrive in position if there is a power shut down, mainly at declines.



1	Brake leads
2	Motor plug

Recommended break leads connection:
- Green lead with red stripes: 24 V DC
- Green lead with blue stripes: GND

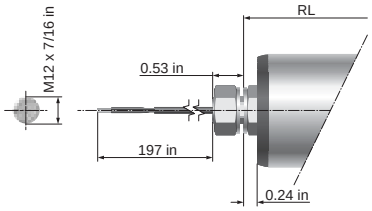
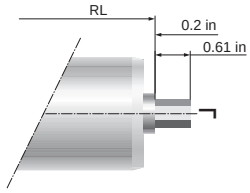
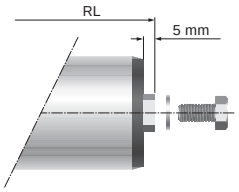
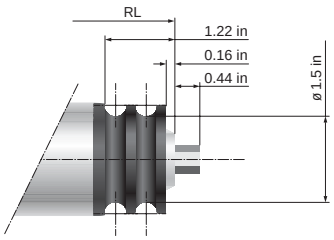
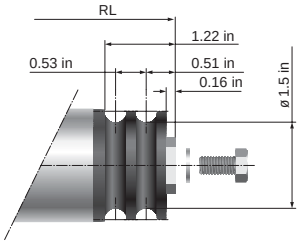
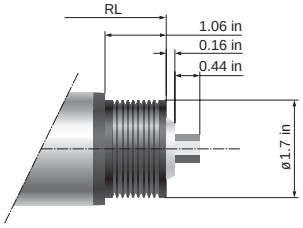
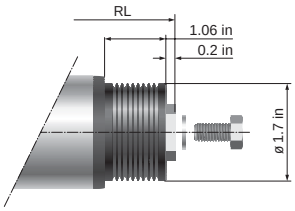
The fail save brake is not sensitive to electrical polarity, so it‘s connection is bi polar; for to avoid confusion it is recommended to connect them as stated above.

Nominal voltage [V DC]	24
Voltage range [V DC]	0 to 28
Brake locking voltage [V DC]	max. 6.0
Brake releasing voltage [V DC]	min. 12.2
Current consumption [A]	0.17
Internal resistance [Ω]	144
Lead wires	AWG 22

Gear ratio	Static holding torque [in-lbs]
24:1	74.3
36:1	111.5
48:1	148.7
64:1	198.2
96:1	297.4

ROLLERDRIVE EC100 B

Shaft executions

Motor shaft	Idler shaft	
	7/16 in hex, spring-loaded	**Female threaded 5/16 in, floating**
	straight	
HEX1	H01	F01
		
	O-ring hub	
	H02	F02
		
	PolyVee hub	
	H03	F03
		

Curves

For curve applications there are tapered RollerDrives and Rollers. For further information see “Technical specifications“, page 66.

- Mechanical performance 18 W
- Roller diameter 1.9 in
- Max. length RL 59 in
- External commutation electronics
- 7 gear ratios
- 15,000 hours minimal life time
- Protection rate IP54

- Noise 55 dB(A), mounted in a conveyor frame
- After run reducing motor stop function
- Electronic brake for holding the motor (Zero Motion Hold)
- Mechanical failsafe brake
- Motor cable with 8 pole Tyco connector

Article number: see fold-out page

ROLLERDRIVE EC110 IP66

Characteristics				Tube material		Shaft material		Tube sleeving		Motor cable
i	v [fpm]	M_N [in-lbf]	M_A [in-lbf]	Steel Zinc plated	Stainless	Steel Zinc plated	Stainless	PVC 0.08 in	PU 1/8 in	Length 39.37 in
4	475	3.0	11.0	•	•	•	•	•	•	•
9	211	6.6	23.0	•	•	•	•	•	•	•
12	158	8.8	31.0	•	•	•	•	•	•	•
16	119	13.0	37.0	•	•	•	•	•	•	•
24	79	19.5	51.0	•	•	•	•	•	•	•
36	53	26.5	81.0	•	•	•	•	•	•	•
48	40	30.0	102.0	•	•	•	•	•	•	•
64	30	37.6	117.0	•	•	•	•	•	•	•

- Mechanical performance 31 W
- Roller diameter 1.9 in
- Max. length RL 59 in
- External commutation electronics
- 8 gear ratios
- 15,000 hours minimal life time
- Protection rate IP66

- Noise 55 dB(A), mounted in a conveyor frame
- After run reducing motor stop function
- Electronic brake for holding the motor (Zero Motion Hold)
- Motor cable with 8 pole Tyco connector

Article number: see fold-out page

	Motor shaft		**Idler shaft**		**Length**
	HEX1	HEX0	Straight F01	Groove 1.25/1.76 F01	Min. RL [in]
	•	•	•		9.82
				•	12.14
	•	•	•		10.27
				•	12.59
	•	•	•		10.12
				•	12.44
	•	•	•		10.12
				•	12.44
	•	•	•		10.12
				•	12.44
	•	•	•		10.57
				•	12.89
	•	•	•		10.57
				•	12.89
	•	•	•		10.57
				•	12.89

Legend:

i	Gear ratio
v	Speed of transport
M_N	Nominal torque
M_A	Peak torque
HEX0	7/16 in solid hexagonal
HEX1	M12 x 1.5 7/16 in, hexagonal
F01	Female 5/16 in, floating

Technical Specifications - p. 60

ROLLERDRIVE EC110 IP66

Technical data

Nominal voltage [V DC]	24
Voltage range [V DC]	22 to 28
No load current [A]	0.6
Continuous current [A]	2.5
Peak current [A]	4.1
System efficiency [%]	52
Maximum permissible ripple from power supply [%]	5
Noise [dB(A)]	55
Ambient temperature for operation [°F]	32 to 104
Ambient temperature for transport and storage [°F]	-4 to 167
Ambient temperature changes [K/min]	max. 1 °K/min; 3 h; two cycles according to IEC 68-2-14
Max. ambient humidity [%]	90, not condensing

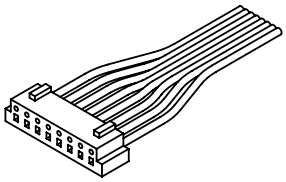
Maximum static load

Maximum static load per RollerDrive

RL [in]	Max. static load [lbs]
12 to 30	450
31 to 39	250
40 to 59	110

Motor plug

The motor plug is manufactured by AMP, consisting of a plug (AMP-part # 175778-8) and terminal pins (AMP-part # 1-175102-1). If the cables are rippled out the plug can be repaired using a crimping tool available directly from AMP (part # 9184381).



Color	Lead	Description
Black	Phase C	Motor leads with AWG 22
White	Phase B	
Red	Phase A	
Yellow	S3 (C)	Hall effects sensor leads with AWG 22
Orange	S2 (B)	
Brown	S1 (A)	
Blue	4.5 to 20.0 V DC	
Green	Ground	

- Mechanical performance 31 W
- Roller diameter 1.9 in
- Max. length RL 59 in
- External commutation electronics
- 8 gear ratios
- 15,000 hours minimal life time
- Protection rate IP66
- Noise 55 dB(A), mounted in a conveyor frame
- After run reducing motor stop function
- Electronic brake for holding the motor (Zero Motion Hold)
- Motor cable with 8 pole Tyco connector

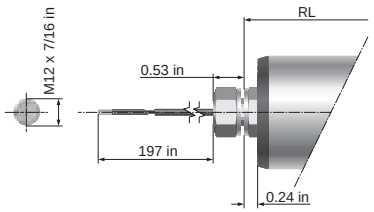
Article number: see fold-out page

Shaft executions

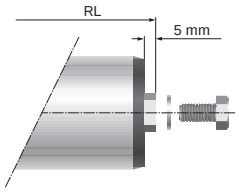
Motor shaft

Female threaded 5/16, floating

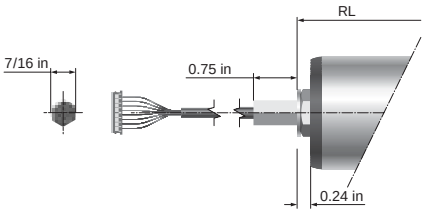
HEX1



F01



HEX0



Curves

For curve applications there are tapered RollerDrives and Rollers. For further information see “Technical specifications“, page 66.

CONTROLS OVERVIEW

Technical characteristics			DriveControl *to control a RollerDrive* DC-EC100	DC-EC200
	Number of connectable RollerDrives		1	1
	Protection rate		IP20	IP20
	Sensor interface			
	Number of interfaces		1	-
	Sensor IN		•	
	PNP/NPN switch		•	
	PLC interface			
	Number of interfaces		-	1
	Speed settings			
	Setting on the control		•	•
	External analog signal		•	•
	External potentiometer		•	
	Temperature monitoring			
	Of control		•	•
	Of motors		•	•
	Current limiting			
	Brake function			
	Smart braking			
	Dynamic braking		•	•
	Zero motion hold		•	•
	Communication			
	Peer to Peer			
	Number of slaves per zone		-	-
	Software functions			
	ZPA			
	Dellocating			
	ZPA-function disable			
RollerDrives				
	EC100	see p. 22	•	
	EC100 B	see p. 38	•	
	EC110	see p. 32		
	EC110 IP66	see p. 46		
	EC200	see p. 28		•
			from page 52	**from page 54**

ZoneControl
to control a Zone and a RollerDrive

HC-EC100	HC-EC110
1	1
IP20	IP20
2	2
•	•
-	-
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
2	2
•	•
•	•
•	•
•	
•	
	•
	•
from page 56	**from page 58**

DRIVECONTROL DC-EC100

Technical data

Nominal voltage [V DC]	24
Voltage range [V DC]	18 to 28
Maximum permissible ripple from power supply [%]	< 5, < 1 recommended
Continuous current [A]	1.8
Fuse [A]	5; slow blow
Protection rate	IP20
Ambient temperature for operation [°F]	32 to 104
Ambient temperature for transport and storage [°F]	-4 to 167
Ambient temperature changes [K/min]	1; 3 h; two cycles according to IEC 68-2-14
Max. ambient humidity [%]	90, not condensing

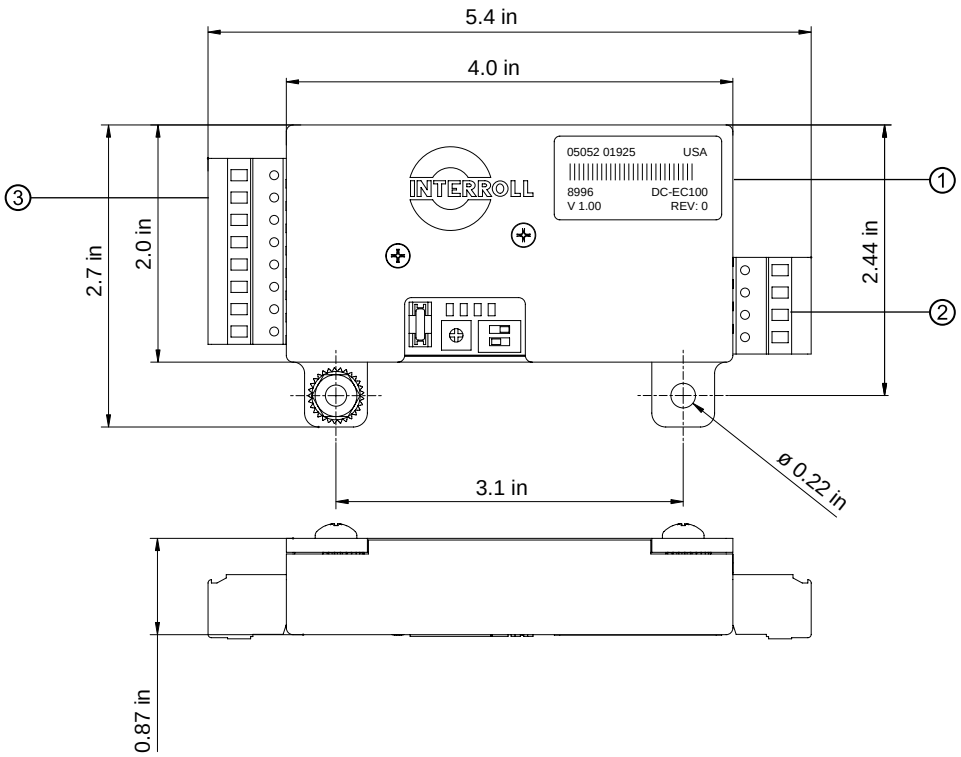
Functions

- Commutation electronics for RollerDrive EC100
- Sensor connection
- Sensor power supply
- Speed control via DriveControl, analog signal or external potentiometer
- Choice of direction of travel via DriveControl or external signal
- LEDs provide motor and sensor diagnostics as well as power, fuse, and temperature status
- Temperature control of DriveControl and motor
- Current limiting due to high temperature of DriveControl or motor
- Choice of logic conversion NPN PNP
- Zero motion hold: When the DriveControl has no start signal, the RollerDrive will be held in place.
- Dynamic braking: RollerDrive acts like a generator and DriveControl feeds back current into the RollerDrive windings

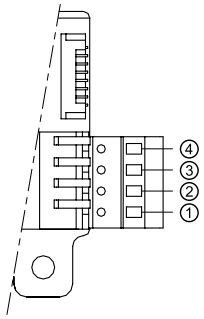
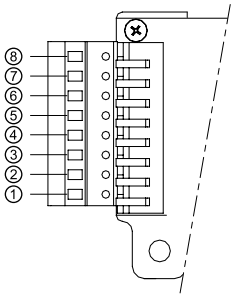
Note: These functions are explained in more detail in the user manual.

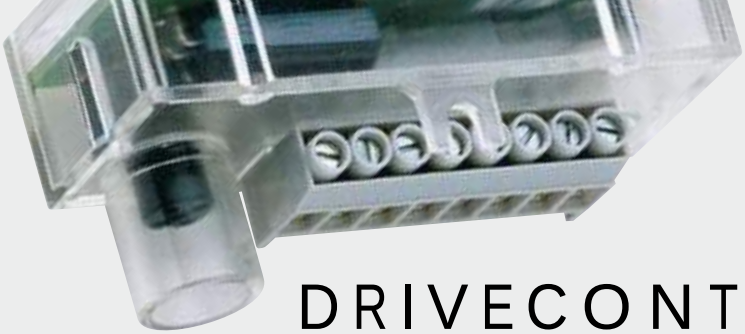
Article number: 8916A

Installation dimensions



Inputs and outputs

1	RollerDrive connection		
2	Sensor connection	Pin	
		1	Sensor +24 V DC output
		2	Sensor common ground output
		3	Sensor fault input
		4	Sensor input
3	Inputs and outputs	Pin	
		1	+24 V DC input
		2	Common ground input
		3	Sensor output
		4	No fault output
		5	REV input
		6	FWD input
		7	External pot+
		8	Speed analog input



DRIVECONTROL DC-EC200

Technical data

Nominal voltage [V DC]	24
Voltage range [V DC]	18 to 30
Maximum permissible ripple from power supply [%]	< 5, < 1 recommended
Continuous current [A]	4
Fuse [A]	4; slow blow
Protection rate	IP20
Ambient temperature for operation [°F]	32 to 104
Ambient temperature for transport and storage [°F]	-4 to 167
Ambient temperature changes [K/min]	1; 3 h; two cycles according to IEC 68-2-14
Max. ambient humidity [%]	90, not condensing

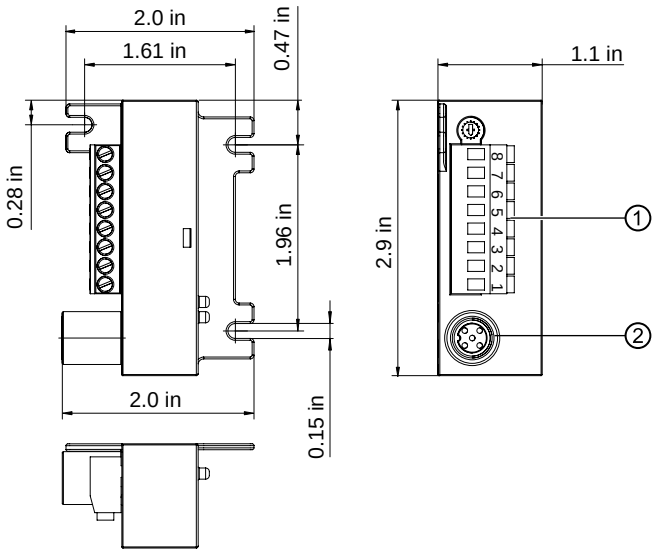
Functions

- Speed control via DriveControl or external analog signal
- PLC interface (programmable logic controller)
- Choice of direction of travel via DriveControl or external signal
- LEDs provide power status and error diagnostics
- Choice of logic conversion NPN PNP

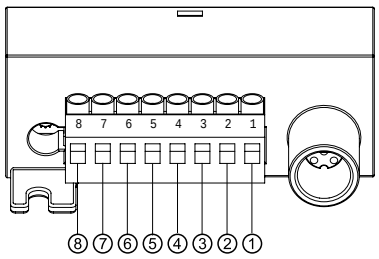
Note: These functions are explained in more detail in the user manual.

Article number: 9008

Installation dimensions



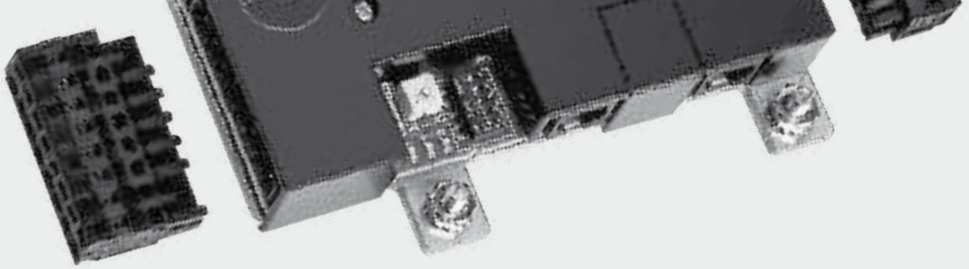
Inputs and outputs

1	Input and output	Pin	
		1	Sensor +24 V DC output
		2	Power GND
		3	Start IN1
		4	Start IN2
		5	Direction IN1
		6	Direction IN2
		7	Fault OUT1
		8	Fault OUT2
2	RollerDrive connection		

Accessories

Part	Characteristics	Article number
Extension cable RollerDrive - DriveControl	Length 63 in	89VK

Technical Specifications - p. 60



ZONECONTROL HC-EC100

Technical data

Nominal voltage [V DC]	24
Voltage range [V DC]	22 to 28
Maximum permissible ripple from power supply [%]	< 5, < 1 recommended
Continuous current [A]	1.8
Fuse [A]	5; slow blow
Protection rate	IP20
Ambient temperature for operation [°F]	32 to 104
Ambient temperature for transport and storage [°F]	-4 to 167
Ambient temperature changes [K/min]	1; 3 h; two cycles according to IEC 68-2-14
Max. ambient humidity [%]	90, not condensing

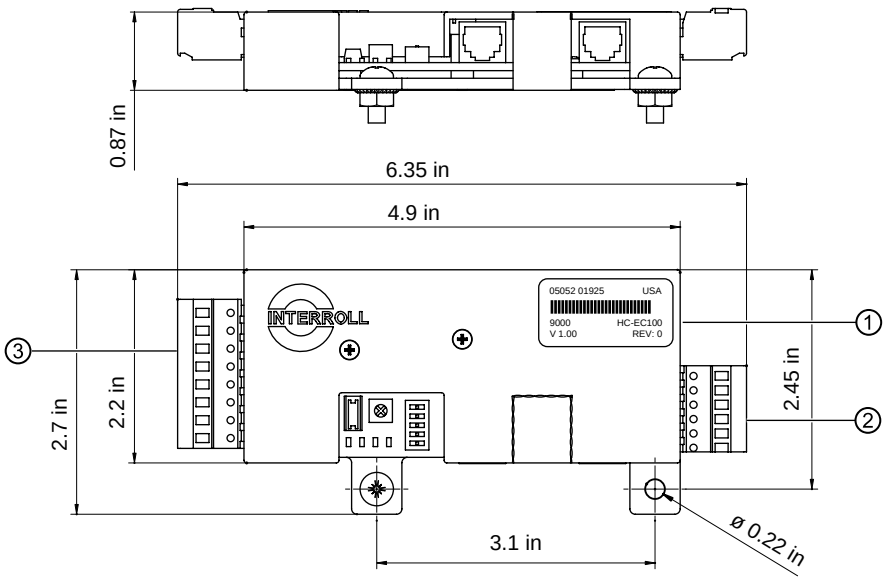
Functions

- Commutation electronics for RollerDrive EC100
- Zone control for zero pressure conveyors
- Zone-to-zone communication
- Jam protection by zone communication
- Reverse or jog entire system: Switch settings and connections on the board allow user to reverse the zone-to-zone logic, jog the entire system, or reverse or jog parts of the system, or bypass those functions altogether (default) without using external cards.
- Multiple dependent RollerDrives in one zone: Up to three RollerDrives can be made to run from one HC-DriveControl (and two dependent cards) to obtain multiple RollerDrives in a single zone.
- LEDs provide motor, sensor and jam diagnostics as well as power, fuse, and temperature status
- Choice of direction of travel via DriveControl or external signal
- Direct start sensor connection, no interface board necessary
- Easy external signal embedding due to defined digital I/O points
- Choice of NPN/PNP logic conversion
- Temperature control of DriveControl and motor
- Current restricted due to high DriveControl or motor temperature
- Zero motion hold: When the DriveControl has no start signal, the RollerDrive will be held in place.
- Dynamic braking: RollerDrive acts like a generator and DriveControl feeds current back into the RollerDrive windings
- Smart braking: Depending on upstream and downstream zone occupancy, the RollerDrive will brake if needed, and coast if no braking is required
- Advanced braking: The combination of dynamic braking followed by zero motion hold

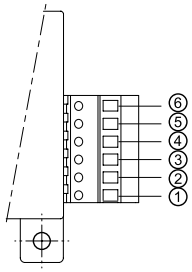
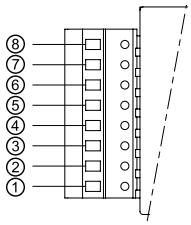
Note: These functions are explained in more detail in the user manual.

Article number: 9000/9001

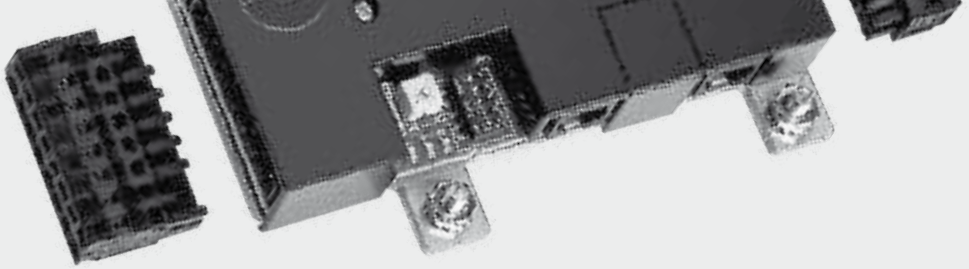
Installation dimensions



Inputs and outputs

1	RollerDrive connection		
2	Sensor connection	Pin	
		1	Sensor +24 V DC output
		2	Sensor common ground output
		3	Sensor fault input
		4	Sensor 1 input
		5	Sensor 2 input
		6	Accum (L-stop) input
3	Inputs and outputs	Pin	
		1	+24 V DC input
		2	Common ground input
		3	Smart 1 output
		4	No fault output
		5	REV input
		6	Smart 1 / FWD input
		7	External pot+
		8	Speed analog input

HC-EC100 Full (9001) offers optical isolated handshake in addition to smart I/O.
See user manual for details.



ZONECONTROL HC-EC110

Technical data

Nominal voltage [V DC]	24
Voltage range [V DC]	22 to 28
Maximum permissible ripple from power supply [%]	< 5, < 1 recommended
Continuous current [A]	2.5
Fuse [A]	5; slow blow
Protection rate	IP20
Ambient temperature for operation [°F]	32 to 104
Ambient temperature for transport and storage [°F]	-4 to 167
Ambient temperature changes [K/min]	1; 3 h; two cycles according to IEC 68-2-14
Max. ambient humidity [%]	90, not condensing

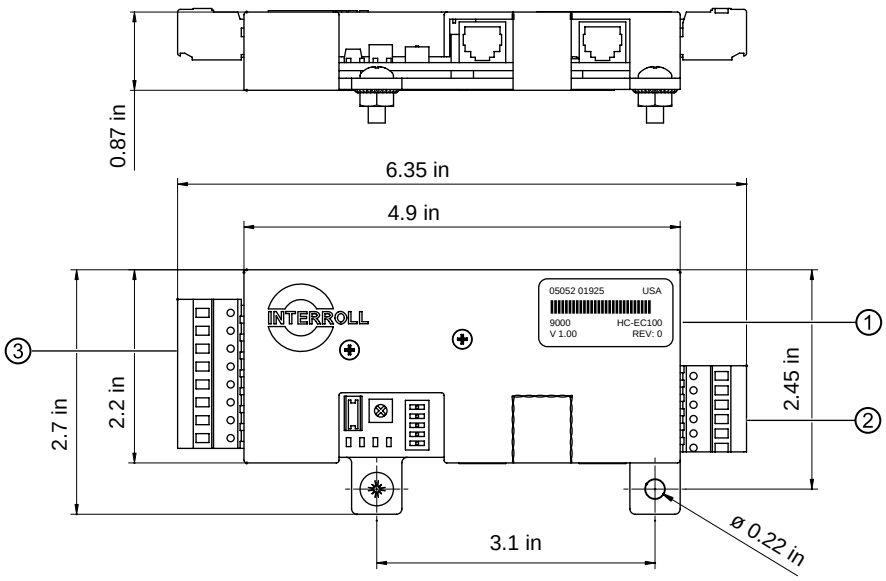
Functions

- Commutation electronics for RollerDrive EC110
- Zone control for zero pressure conveyors
- Zone-to-zone communication
- Jam protection by zone communication
- Reverse or jog entire system: Switch settings and connections on the board allow user to reverse the zone-to-zone logic, jog the entire system, or reverse or jog parts of the system, or bypass those functions altogether (default) without using external cards.
- Multiple dependent RollerDrives in one zone: Up to three RollerDrives can be made to run from one HC-DriveControl (and two dependent cards) to obtain multiple RollerDrives in a single zone.
- LEDs provide motor, sensor and jam diagnostics as well as power, fuse, and temperature status
- Choice of direction of travel via DriveControl or external signal
- Direct start sensor connection, no interface board necessary
- Easy external signal embedding due to defined digital I/O points
- Choice of NPN/PNP logic conversion
- Temperature control of DriveControl and motor
- Current restricted due to high DriveControl or motor temperature
- Zero motion hold: When the DriveControl has no start signal, the RollerDrive will be held in place.
- Dynamic braking: RollerDrive acts like a generator and DriveControl feeds current back into the RollerDrive windings
- Smart braking: Depending on upstream and downstream zone occupancy, the RollerDrive will brake if needed, and coast if no braking is required
- Advanced braking: The combination of dynamic braking followed by zero motion hold

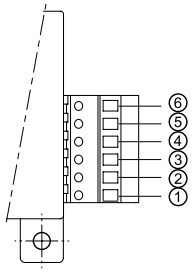
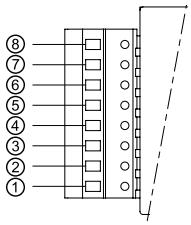
Note: These functions are explained in more detail in the user manual.

Article number: 9004

Installation dimensions

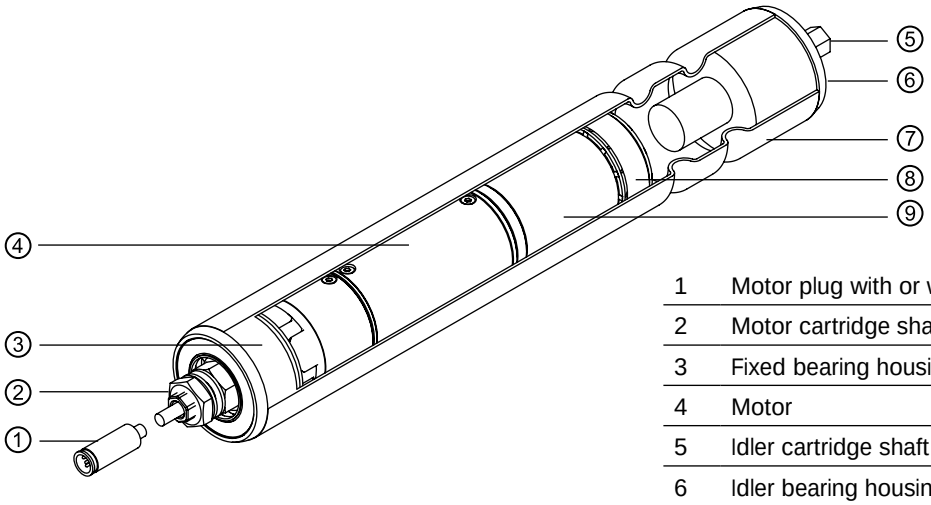


Inputs and outputs

1	RollerDrive connection		
2	Sensor connection	Pin	
		1	Sensor +24 V DC output
		2	Sensor common ground output
		3	Sensor fault input
		4	Sensor 1 input
		5	Sensor 2 input
		6	Accum (L-stop) input
3	Inputs and outputs	Pin	
		1	+24 V DC input
		2	Common ground input
		3	Smart 1 output
		4	No fault output
		5	REV input
		6	Smart 1 / FWD input
		7	External pot+
		8	Speed analog input

TECHNICAL SPECIFICATIONS

Components



1	Motor plug with or without cable
2	Motor cartridge shaft
3	Fixed bearing housing assembly
4	Motor
5	Idler cartridge shaft
6	Idler bearing housing assembly
7	Tube
8	Non-slip drive
9	Gearbox

Conveying speed

Selecting the conveying speed

RollerDrive is following the principle of keeping the motor speed constant and selecting the conveying speed by having different gear box reductions available. Details are described which each of the RollerDrive products.

Load capacity

Load capacity of RollerDrive

Without thru going shaft the RollerDrive is seen as roller without shaft, comparable to a flow storage roller. However there is one specific point to be noticed, the motor end is always fixed with the side frame of the conveyor. The non driven end is with the most popular version, the 5/16 HEX spring loaded shaft, only a loose fit in a hex hole. That fact is compensated by having it equipped with a double bearing configuration. Thus the whole RollerDrive can be seen as roller without shaft but with fixed stub shafts. See static load specification according to load table in each RollerDrive section.

In an application it is important that in minimum always three rollers including the RollerDrive are located underneath the box. In most of the applications the torque not the load will be the minimum factor to size the unit. For detailed calculations of the maximum load in relation to the roller length, the Roller Calculation Program is ready for download on the Interroll Web Page. Using the program the shaft type must be entered as “Round” and the shaft location as “Stub Axle”.

Rolling resistance and performance

When a box is conveyed on a roller lane, there a the following forces to be overcome:

- Static friction
- Rolling friction

A box is moving with constant speed on a conveyor, following equation is valid:

$F = m \cdot g \cdot \mu$

F	Tangential force in Newton
m	Mass in kg
g	Acceleration of gravity 9.81 m/sec
µ	see table below for factors related to box material

Table of friction coefficient

Material	Friction coefficient
Steel	0.03
Polymer, flat	0.04
Polymer, uneven	0.05
Wood	0.05
Carton, hard	0.06
Carton, soft	0.08

Example:	
Load	30 kg
Box material: Techno Polymer, friction coefficient	µ 0.04
Speed	0.5 m/sec
Necessary tangential force	11.77 N
At a radius of 25 mm the required torque is	0.3 Nm
That leads to a mechanical performance of	5.88 W

The performance which is needed to convey a box at constant speed on a roller conveyor is primary determined by the shape and the material of the bottom surface of the box. Less performance is needed for a flat and hard surface, like a steel box. But steel also has the tendency to slip on the rollers which results in longer acceleration and deceleration times. A rule of thumb is about 3 % of the load is needed as tangential force for hard box material. Using carton boxes on roller conveyors needs more performance. The friction coefficient is about 8 %. The difference to steel boxes is used to deform the bottom surface when running on a roller conveyor. Thus, this energy is not available for transportation.
One cycle in a conveyor consists from acceleration to constant conveying to deceleration. Due to that, for performance calculations the acceleration is a critical phase which must be determined carefully.
In the acceleration phase static friction has to be overcome and is replaced by the very less rolling friction. That explains the characteristic currant peak at the beginning of each conveying cycle. Due to the complexity of each application it is recommended to consult an Interroll RollerDrive Expert and the RollerDrive Calculation Program to find out what is the right product for each application.

TECHNICAL SPECIFICATIONS

Torque transmissions

Conveyor without torque transmission

RollerDrive conveyors without torque transmission are seldom used. They are suitable for evenly conveyed heavy loads.

A minimum number of RollerDrives must contact the conveyed item at any time, in order to ensure that the conveyed item is driven forward.

Conveyor with torque transmission

If a conveyor is driven by RollerDrives, the torque must be transmitted to the non-driven rollers of the conveyor. There are several ways to achieve this:

Friction drive

- O-ring running in grooves or grooved drive heads
- PolyVee belt running in PolyVee drive heads

When selecting the right torque transmission, it is important to know the size of the conveyed item. If the construction of the RollerDrive zone within the conveyor allows the item‘s center of gravity to stop exactly on a RollerDrive, the belts are relieved strongly. In the acceleration phase most of the start torque is directly transmitted from the RollerDrive tube to the conveyed item. If there is any possiblity that the conveyed item can come to a stop in front or behind a RollerDrive, it is important to select a torque transmission able to transmit high start up torques properly throughout the entire life of the application.

O-ring

The O-ring can convey applications up to 0.6 m/s and 40 kg. It is important that the load‘s center of gravity always stops directly on a RollerDrive.

The RollerDrive drives up to 10 rollers via O-rings.

PolyVee

There are several advantages to using PolyVee belts compared to O-rings. Due to a 300 % higher ability to transmit torque, all rollers in a zone are powered very evenly and smoothly. No clamping element is required as the belt is flexible enough to remain mountable and to gap hole tolerances, and, on the other hand, to build up sufficient tension for the torque transmission. That helps to reduce acceleration and decelaration distances.

The PolyVee belt acts in the same way in incline and decline conveyors. The torque is transmitted very evenly to all rollers in order to increase the friction between rollers and conveyed item.

When transmitting the torque with PolyVee on more than 15 rollers, there will be an RPM drop of about one RPM per roller. The reason is a transmission effect caused by shifting the neutral phase of the belt under load.

Characteristics of PolyVee belt:

- Flexible type PJ; ISO 9981; DIN 7867
- On a PolyVee head, you can use two belts with up to four ribs including a groove between the belts.
- Available pitch: 60, 73, 75, 94, 100, 105, 120, 133, 160 mm

Normally, there are two versions used for PolyVee belts:

2-rib PolyVee belt:

Applications with a speed in the range of 0.6 m/s up to 2.0 m/s weighing less than 50 kg. The conveyed item must not come to a stop on the RollerDrive. RollerDrives with 2-rib PolyVee belts can drive up to 20 rollers.

3-rib PolyVee belt:

Heavy conveyed items, using the full performance of RollerDrives. 3-rib PolyVee belts can also be used for long conveyor sections. The calculation program helps to calculate the maximum number of rollers which are driven by RollerDrive and 3-rib PolyVee belts.

The last roller within a zone where the torque is transmitted with PolyVee is exposed to a unilateral force. That is why it is not recommended to use a hex spring loaded shaft for the last roller. There is a risk that the shaft moves out of the hex hole.

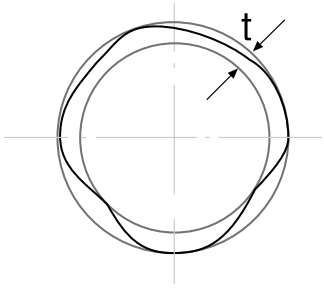
TECHNICAL SPECIFICATIONS

Tube materials

	Carbon steel, electro zinc plated and passivated DIN 2394	Stainless steel DIN 2463
Mechanical characteristics	High resistance and bending stiffness Sensitive to abrasion and scratching damaging the passivation Do not expose to high thermal fluctuations, as there is the risk of cracks in the zinc coating	High resistance and bending stiffness
Dimensions	Outer diameter of 1.9 in and a wall thickness of 0.06 in	Outer diameter of 1.9 in and a wall thickness of 0.06 in
Concentricity deviation	The maximum concentricity deviation is 0.01 in	The maximum concentricity deviation is 0.01 in
Chemical resistance	Resistant to corrosion when the zinc coating is undamaged	Resistant to corrosion

Concentric deviation

The concentric deviation is the maximum radial deviation of the tube section from the perfect circle.
For example, a concentric deviation (t) of 0.01 in means that the radial deviation of the entire tube is 0.01 in.
The smaller the concentric deviation of the rollers is, the better is the frictionless transport of the conveyed items and the higher is the life-expectancy of the rollers.



Concentric deviation (t)

The concentric deviation depends on the tube‘s length, diameter and material. The concentric deviation increases depending on the size of a tube. It is recommended to use larger diameters for long tubes.

Tube sleeving

The RollerDrive and the rollers can be sleeved with PVC or PU sleeves.

	PVC sleeve	PU sleeve
Color	grey	orange
Wall thickness [in]	0.08	1/8
Outer diameter on Roller [in]	2.06	2.15
Hardness	63 shore	80 shore

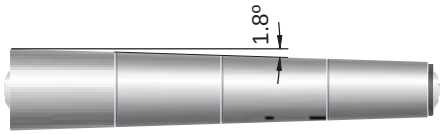
With a hardness of 63 or 80 shore, the friction between the conveyed item and the RollerDrive is quite positively increased. In addition, the material is scratch-resistant and and resistant to several chemicals.
The sleeves fulfill RoHS requirements.

Shafts

All RollerDrive bearing housings on the motor end are made from electro conductive Techno Polymer material. This solves the problem of static charged electronic components in the RollerDrive. Electric conduction is transmitted via the bearings to the conveyor‘s profile. For this reason, it is essential to properly ground the conveyor module.
Rollers with torque transmission are usually shipped in anti-static design. For rollers without torque transmission, the antistatic design must be ordered separately.

Curves

For applications with curves, there are tapered RollerDrives and rollers. In the interior of these rollers there is an ordinary RollerDrive or roller with tapered sections. Thanks to the tapered shape of the rollers, the load is conveyed around the curve without contacting the conveyor's lateral profiles. The shaft of the tapered roller must be installed with an inclination of 1.8°. In order to fasten the rollers/RollerDrive securely, there must be a 1.8° angle compensation.



Torque transmission

Standard O-rings and PolyVee belts are available in combination with the fixed drive roller series 3500. Due to the projecting end of the drive head (RL = EL – 36) the inner curve radius R_i are 770 mm and 820 mm.

Zones

Additional zones must be set up in curves to avoid accumulations of conveyed items. As pressure builds up and accumulates in an outward direction, conveyed items in curves are likely to be pushed over the conveyor frame. This may result in damage to conveyed items and persons.

Dimensioning

In dimensioning the RollerDrive, it is important to use the mean diameter of the tapered elements to calculate the required torque and conveyor speed. The fitting length should be calculated so that the conveyed items do not contact the side profiles during transport.

The following steps are required:

Calculation for minimum outer radius R_a or minimum roller length EL_{min}

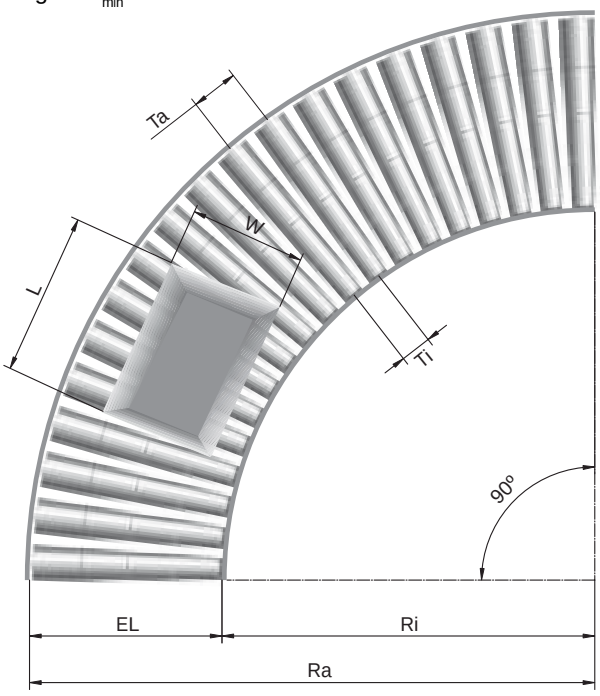
$$R_a = \sqrt{(R_i + W)^2 + (\frac{L}{2})^2} + 50$$

$$EL_{min} = R_a - R_i$$

Adapting the calculated EL_{min} to the standard length:
(next larger size in 50 mm increments)
286, 336, 386 … 936 mm (250, 300, 350 … 900 mm for gravity rollers)

Calculation of actual R_a with selected standard fitting length (EL):

$$R_a = EL + R_i$$



RollerDrives
Overview - p. 14

Controls
Overview - p. 50

Roller pitch in curves

The roller pitch T_a depends on the properties and condition of the conveyed item and should be selected so that safe transport is ensured. In selecting the smallest possible roller pitch T_i, the diameter of the tapered elements must be taken into account so that these do not contact each other. Otherwise, any T_i value can be selected. The only restriction to observe is that the first or last roller has a ratio to the curve's total angle of approx. $T_i/2$ and that standard belts lengths are also considered.

Roller pitch T_a, measured at the inner edge of the outer profile, can be calculated with the following formula:

$$T_a = \frac{T_i \cdot R_a}{R_i}$$

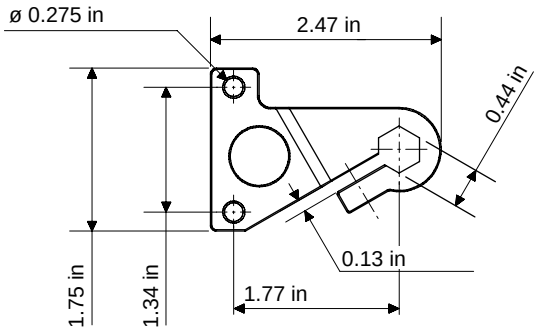
The friction in curves is 50 % higher for straight conveyor sections. That is why a higher torque and a lower speed is required.

Using a higher gear speed offsets the larger diameter of the tapered rollers.

Anti-spin bracket

If you are using a RollerDrive EC110 with solid hex shaft, you should secure it with an anti-spin bracket. This prevents the RollerDrive from rotating in the frame‘s hole.

Anti-spin bracket dimensions (flat up version)

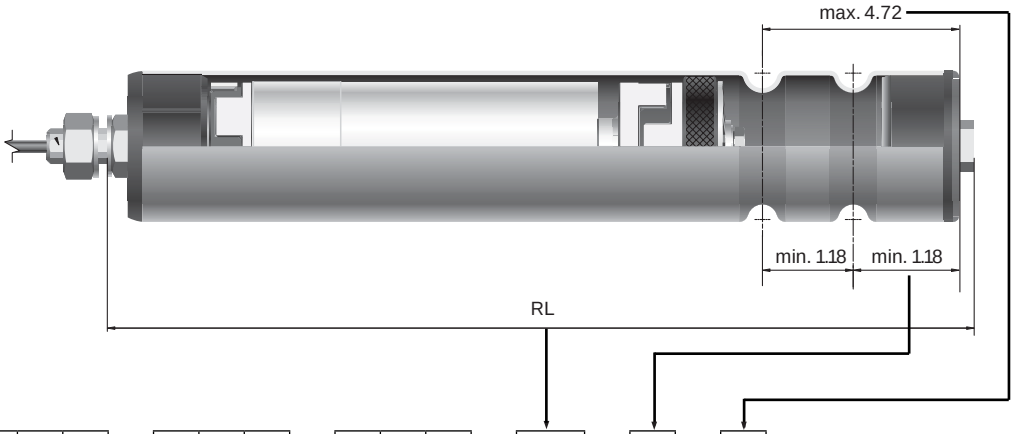


Anti-spin bracket and hardware kit

No.	Description	Qty
1	Bracket flat up	1
	Bracket point up	1
2	Template	1
3	1/8“ Allen wrench	1
4	Button head screw	1
5	Serrated flange hex cap screw	2
6	Hex tooth washer nut	2

To correctly adjust the hole pattern, use the template included in delivery.

ROLLERDRIVES CONFIGURATOR



8	C	1	4	G	4	9	H	1	1	-	RL		

Idler shaft		zinc plated	stainless steel
H01	7/16 in, HEX spring loaded	1	2
F01	Female 5/16 in, floating	7	8
H03	7/16 in, spring loaded, PolyVee	A	B
F03	Female 5/16 in, floating, PolyVee	C	D
H02	7/16 in, HEX spring loaded, O-ring	G	H
F02	Female 5/16 in, floating dual bearing	I	J

Motor shaft		zinc plated	stainless steel
HEX0	5/16 in solid hexagonal	5	6
HEX1	M12 x 1.5 5/16 in hexagonal	1	6
HEX2	M12 x 1 7/16 in hexagonal		2

Motor housing	
All types except EC200	H
EC200	J

Tube group	zinc plated	stainless steel
Without grooves (ST)	G49	R04
Fixed groove (2G)	P28	P35
Variable groove	R06	R61
PVC sleeving (staight)	R69	R15
PVC sleeving (2 groove)	P32	P37
Polyurethan sleeve (ST)	P44	M55
Polyurethan sleeve (2G)	P30	F36

Gearbox	
4:1 ratio	8
9:1 ratio	9
12:1 ratio	1
16:1 ratio	2
24:1 ratio	3
36:1 ratio	4
48:1 ratio	5
64:1 ratio	6
96:1 ratio	7

Cable type	
Standard	1

Motor type	
HOBT	T
EC100	C
EC100 B	H
EC110	E
EC110 IP66	Z
EC200	P

ARTICLE NUMBERS

Controls

DriveControls

Article	Article number
DC-EC100	8916A
DC-EC200	9008

ZoneControls

Article	Article number
HC-EC100	9000
HC-EC100 Full	9001
HC-EC110	9004

Accessories

Cables RollerDrives

Article	Cable length [in]	Article number
Extension cable RollerDrive - DriveControl	63	89VK

Anti-spin bracket

Article	Article number
Anti-spin bracket flat up	N582
Anti-spin bracket point up	N583

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en-US DEC / 2008. 750 / DW / KON

Interroll Platform for Conveyor Modules
Performance in Detail

Energy-efficient 24 V conveyor technology

The most efficient solution is selected for each conveyor task.

- Zero pressure accumulation conveying with 24 V drives
- Variant with 400 V main drive for high-performance applications
- Belt conveyor with Interroll drum motors
- No pneumatics required

High throughput

Powerful conveyor technology.

- Transport speed up to 2 m/s
- Distribution output up to 3600 units/h possible
- Diverting without interrupting the material flow

Scalability

Simple planning, implementation and expansion of conveyor systems.

- Modular concept
- Standard interfaces
- Quick and easy installation

Ergonomics

Well thought-out solutions for convenient and safe work.

- Quiet operation (< 60 dBA without conveyor belt)
- Safety due to 24 V technology
- Minimized tool demand for the entire platform

Control

Future-oriented 24 V control concept for every need.

- Open interfaces with high-speed fieldbus
- Internal logic for reduced control effort

Continuous side profile design

A side profile for all modules for flexible routing.

- High-quality powder-coated steel profile
- A multitude of fastening options on the profile
- Can be used as an electrical conduit

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Crossbar

Rigid connection of side profiles, which also serves as an electrical conduit.

- As an electrical conduit, usable for up to ten cables
- Sealable against dirt and contamination

Plastic clip for roller fixing

Simple and quick roller assembly and maintenance.

- Assembly and disassembly of rollers from the top
- Multi-use clip
- Simple subsequent adjustment of the roller pitch

Universal support

For quick and flexible attachment of side guides, sensors, reflectors and other add-on components.

- Solid universal support, can be installed from the top
- Flexible universal support, freely installable at any point of the side profile

Assembly from the top

Assembly and maintenance of all modules with little effort

- Maintenance of roller and belt conveyors from the top
- Easily accessible components and connections
- Tool-free roller assembly with roller clips

Sensor holder

Precise positioning of sensors and reflectors for efficient material flow

- Reliable installation and protection of sensors
- Switching state always visible
- Fast repositioning

Flexible side guides

Flexible and safe guidance of products

- Simple conversion to other material dimensions
- Flexible forming
- Continuous height adjustment

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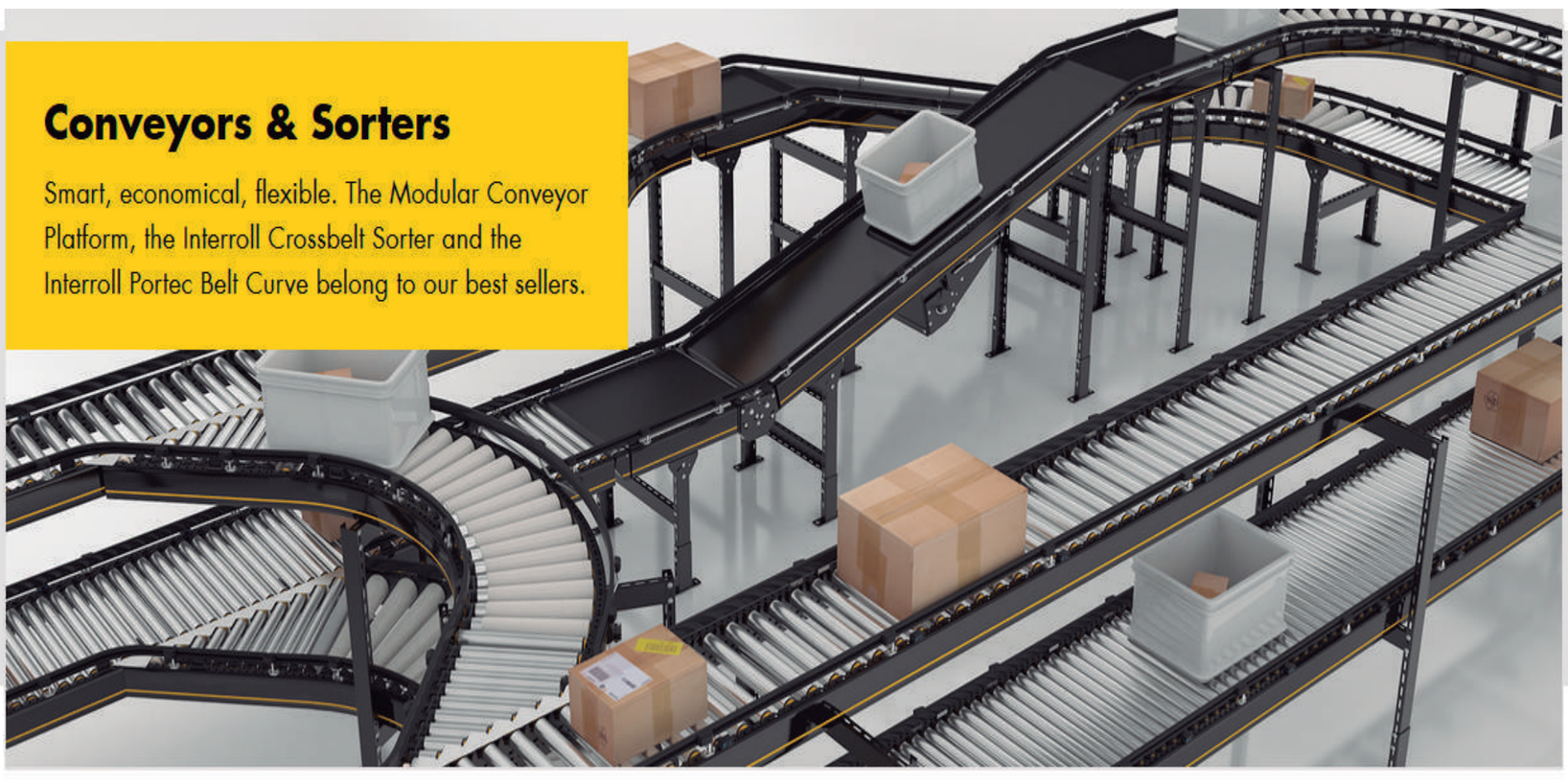
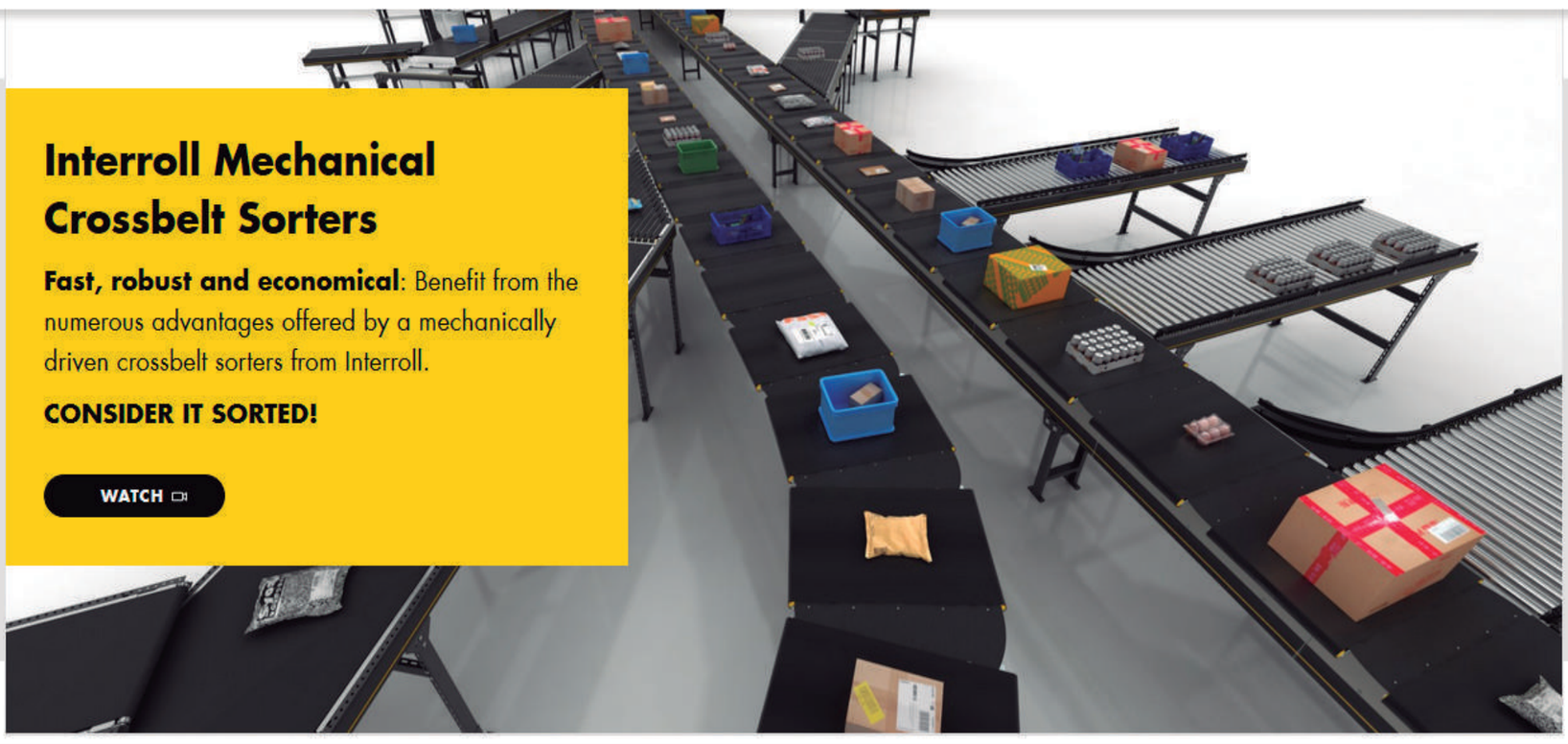


Conveyors & Sorters

Smart, economical, flexible. The Modular Conveyor Platform, the Interroll Crossbelt Sorter and the Interroll Portec Belt Curve belong to our best sellers.



Interroll Mechanical Crossbelt Sorters

Fast, robust and economical: Benefit from the numerous advantages offered by a mechanically driven crossbelt sorters from Interroll.

CONSIDER IT SORTED!

WATCH

- Conveyor Rollers
- Drives and Controls
- New Modular Conveyor Platform
- What is MCP?
- Interroll Belt Curve
- SORTERS
  - High Performance Crossbelt Sorter
  - Horizontal Crossbelt Sorter
  - Vertical Crossbelt Sorter
  - Infeeds
  - Destinations
- Spiral Lift
- Specialty Conveyors
- Pallet Handling

Global demand for fast, economic and reliable sortation technology is on the rise. Interroll has the right answer.

Watch the interview!

WATCH!

Today, over 400 Interroll Crossbelt Sorters are already in use worldwide by industry leaders such as Amazon, DHL, FedEx, UPS, Hugo Boss, Inditex (ZARA), Zalando and the Swiss, Austrian, and Chinese postal systems. Less complex control systems are used for this automation solution.

Therefore, there is no need for expensive installation, maintenance or reconfiguration expertise for the systems. The unique design principle ensures maximum availability, a very long system service life, low operating costs, and fast return on investment.

With the **horizontal** crossbelt sorter, goods can also be transported in curves and up or down slopes. This makes for an extremely flexible, three dimensional sorting system. The **vertical** crossbelt sorter has a space saving design and enables precise discharge and careful transport.

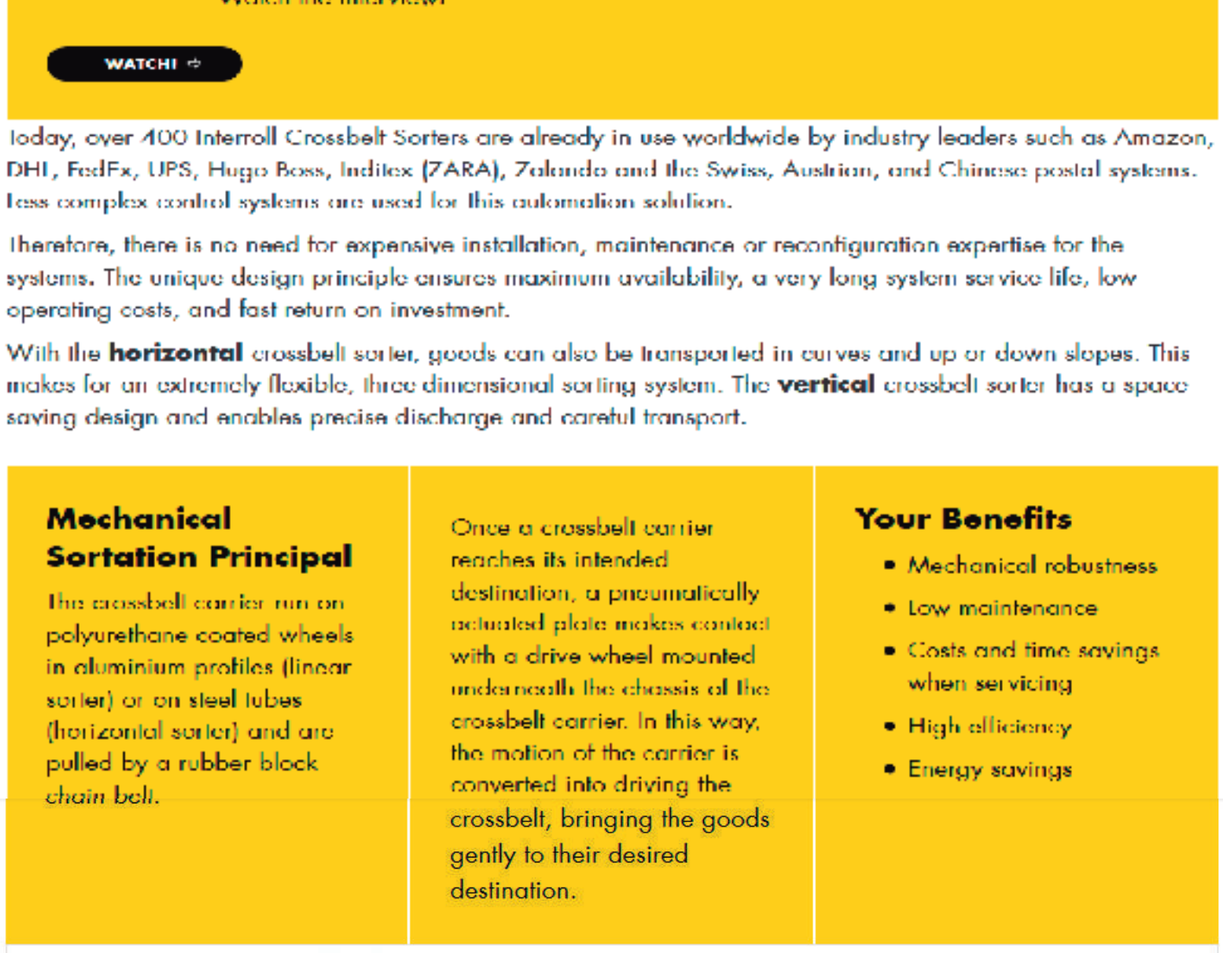
Mechanical Sortation Principal

The crossbelt carrier run on polyurethane coated wheels in aluminium profiles (linear sorter) or on steel tubes (horizontal sorter) and are pulled by a rubber block *chain belt*.

Once a crossbelt carrier reaches its intended destination, a pneumatically activated plate makes contact with a drive wheel mounted underneath the chassis of the crossbelt carrier. In this way, the motion of the carrier is converted into driving the crossbelt, bringing the goods gently to their desired destination.

Your Benefits

- Mechanical robustness
- Low maintenance
- Costs and time savings when servicing
- High efficiency
- Energy savings



INTERROLL SOLUTIONS FOR SORTATION

NEW: Horizontal High-Performance Crossbelt Sorter

MORE

Horizontal Crossbelt Sorter

MORE

Vertical Crossbelt Sorter

MORE

Infeeds

MORE

Destinations

MORE

Consider it sorted!

WATCH NEW ANIMATION!