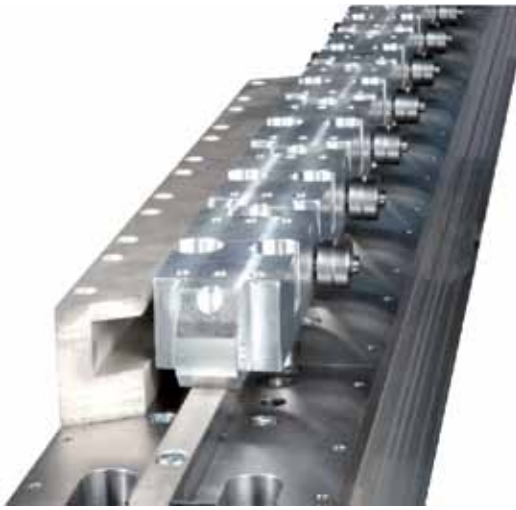# Motion
INDEX DRIVES, INC.

Precision Link Conveyor
LF Series

Precision Link Conveyor LF – design and mode of operation

The main component is a continuous chain manufactured from highly precise aluminum links. There are four cam followers per link for the vertical guidance and the guide rails are hardened and fine-milled. Two cam followers provide horizontal guidance through a hardened and milled guide rail. The links are connected by bolts and needle bearings.

The main frame is made from extruded aluminum and steel plates. The conveyor can be mounted to the extruded aluminum or the steel plates. Additional external stations can also be mounted there.

The chain is driven by a hardened cam wheel which is driven by a standard indexer or any other custom specified drive. At the other end, a hard 180° cam guides the chain. This cam is preloaded, so there is no backlash at the links. The linear stroke of the chain depends on the diameter of the cam wheel. One cycle of the indexer equals a linear stroke of one, two, or three links.

Advantages for design engineers and special machine builders

Proven reliable through many years of service

Vertical assembly - saves room. The empty carriers travel through the bottom of the machine

Horizontal assembly - in an oval formation. Both sides of the machine can be used for assembly

The alternative drive shaft of the indexer can be used for a synchronously rotating parallel shaft to drive other units

The aluminum profile system can be used to mount other external stations fast and easily

Allowance for individual customer requirements

Custom drives available

Optional overload protection

Dwell and index angle can be customized in a large range

Non-standard links and linear strokes are possible

The chain can be designed in metric or imperial units

Customized color without additional cost

Stainless steel, nickel plating or other special surfaces are available

Technical benefits for users

High reliability and long lifetime

Robust method of construction

Proven to last many years

Needle or ball bearings rolling in oil bath or on clean, dry and hard surfaces

Low maintenance (only once a year check and adjust the pre-loading of the chain)

Easy to operate using Allen Bradley PLC

The sky is the limit for the Motion product line. Flexible, made-to-order custom designs which are not featured in the product catalog have long been embedded in our corporate philosophy. We keep 10% of our entire workforce in reserve for these custom applications. Our skilled staff are available to assist our customers on a daily basis.

Our drives meet the highest standards regarding quality and precision. Our cams are manufactured in a different manner with regards to our competition, therefore it is often possible to use smaller rotary table sizes supplied by Motion instead of larger ones supplied by our competitors.
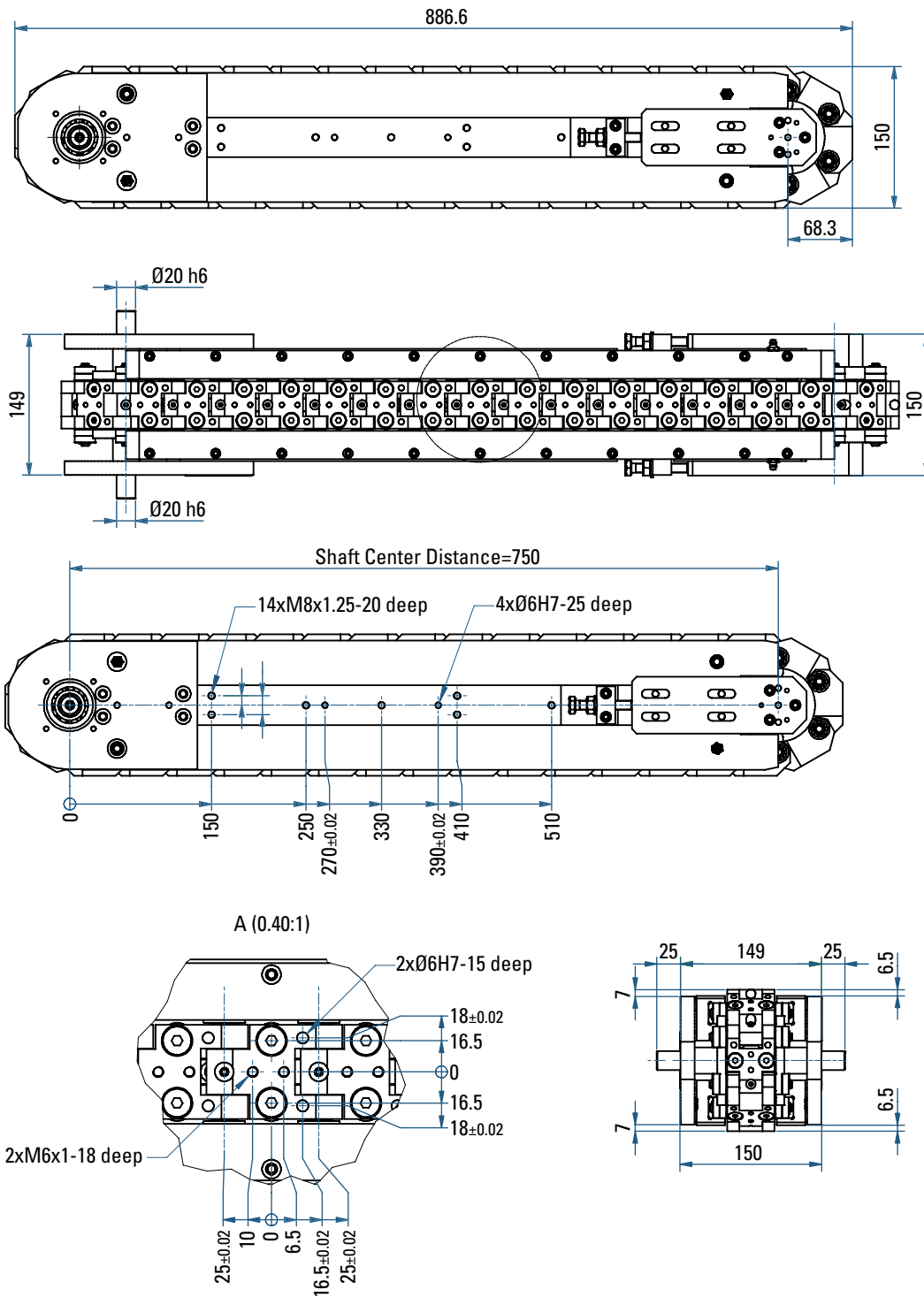
Our extensive design expertise enables us to meet customer requirements down to the last detail. We can combine the advantages of different forms of drives to create new value-added solutions which fit the bill completely. This is the added value which we have been offering to our customers in different sectors for many years.

Main fields

Assembly Industry, Medical Technology, Cosmetics, Electronic Industry

Fast assembly of small parts - up to 150 cycles per minute

Transportation and manufacturing of wires or similar parts

Mechanical and optical investigation

Welding, Tumbling, Riveting, Bending, Marking, Filling....

877-866-1677

LF050

886.6

150

68.3

Ø20 h6

149

150

Ø20 h6

Shaft Center Distance=750

14xM8x1.25-20 deep

4xØ6H7-25 deep

0

150

250

270±0.02

330

390±0.02

410

510

A (0.40:1)

2xØ6H7-15 deep

18±0.02

16.5

0

16.5

18±0.02

2xM6x1-18 deep

25±0.02

10

0

6.5

16.5±0.02

25±0.02

25

149

25

6.5

7

7

6.5

150

Dimensions

The dimensions pictured are standard for the LF050 Precision Link Conveyor. Customized applications centered around the LF050 standard size link can be manufactured upon request. Motion LF050 Conveyors can be mounted on the extruded aluminum. The links and the steel plates can be machines to your specifications. The conveyor can be delivered without drive or the drive can be servo. Special dust covers or rubber lips between the links are available.
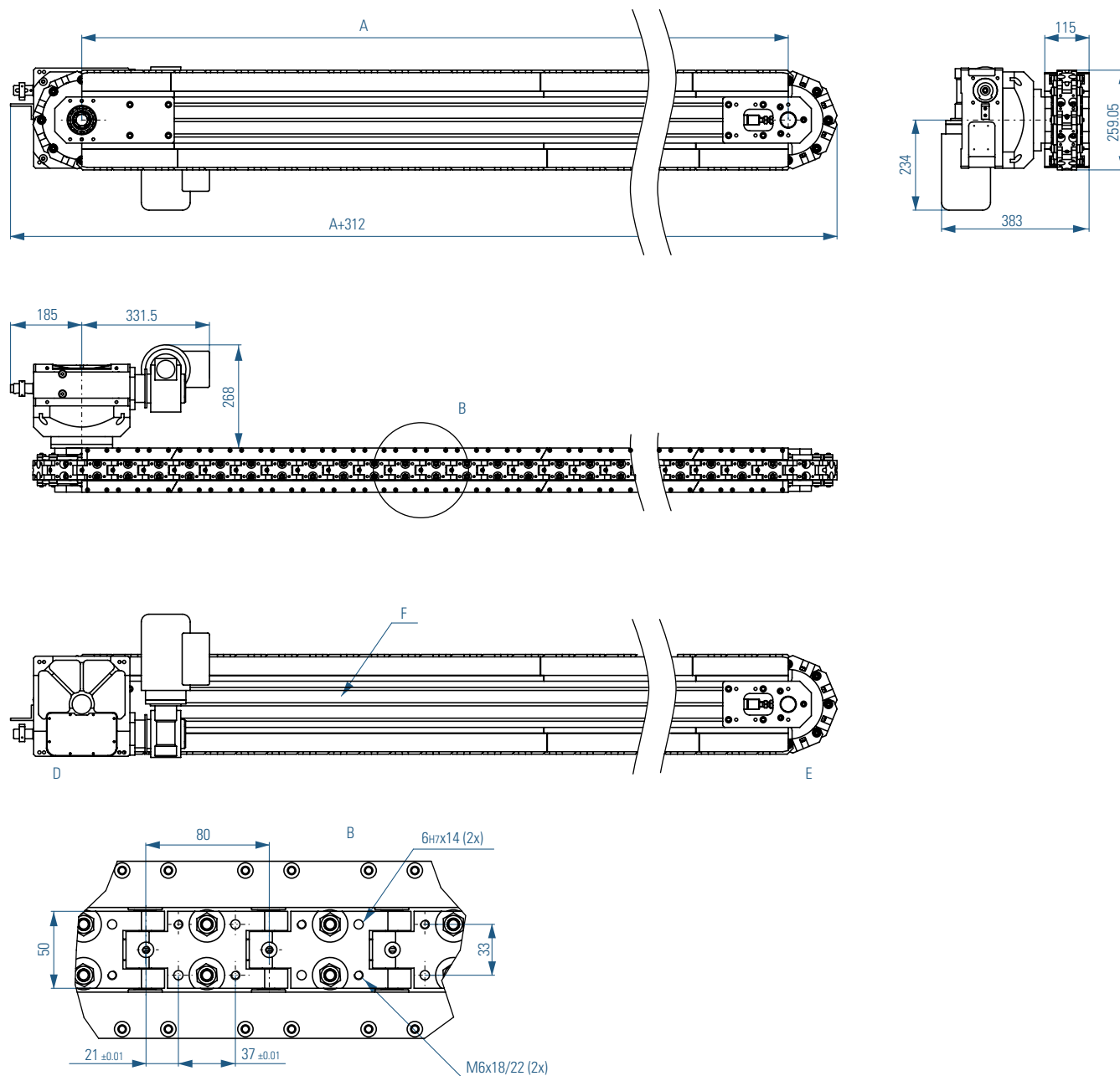
Load Table LF050

The load table for the LF050 is available only upon request at this time.

Technical specifications

Technical specifications for the LF050 are only available upon request at this time.

LF080

A

A+312

115

259.05

234

383

185

331.5

268

B

F

D

E

80

B

6H7x14 (2x)

50

33

21 ±0.01

37 ±0.01

M6x18/22 (2x)

The shown drive is a RT160 with brake motor (Kobold) size IEC71 and wormgear FRS50

Dimensions

The dimensions shown here are the standard dimensions. Dimension "A" depends on the number of links. Motion LF080 Conveyors can be mounted on the extruded aluminum "F". The links and the steel plates can be machined to your specifications. The dimensions marked with * depend on the size of the drive used. The conveyor can be delivered without drive or the drive can be a servo. Special dust covers or rubber lips between the links are available.

⚠ Caution! Allow space on one side of the index wheel for adjusting the preload!

A = Distance Between U-Turns

D = Index Wheel

E = The 180° Cam

F = Aluminum Profile System 8-80x120

Load Table LF080

s [mm]	t [s]	n_L= 12 ; n_T= 32 A= 960mm				n_L= 18 ; n_T= 44 A= 1440mm				n_L= 24 ; n_T= 56 A= 1920mm				n_L= 30 ; n_T= 68 A= 2400mm				n_L= 36 ; n_T= 80 A= 2880mm			
		m [kg]				m [kg]				m [kg]				m [kg]				m [kg]			
		0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2
80[1]	t=	0.16	0.19	0.22	0.25	0.18	0.22	0.26	0.29	0.21	0.25	0.3	0.23	0.23	0.28	0.33	0.37	0.25	0.30	0.35	0.4
160[2]	t=	0.24	0.29	0.34	0.38	0.28	0.34	0.40	0.45	0.31	0.39	0.45	0.35	0.35	0.43	0.50	0.56	0.38	0.46	0.54	0.61
240[3]	t=	0.32	0.40	0.46	0.52	0.38	0.47	0.54	0.61	0.43	0.53	0.61	0.47	0.47	0.58	0.68	0.76	0.51	0.63	0.74	0.83

s [mm]	t [s]	n_L= 42 ; n_T= 92 A= 3360mm				n_L= 48 ; n_T= 104 A= 3840mm				n_L= 54 ; n_T= 116 A= 4320mm				n_L= 60 ; n_T= 128 A=4800mm				n_L= 66 ; n_T= 140 A=5280mm			
		m [kg]				m [kg]				m [kg]				m [kg]				m [kg]			
		0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2
80[1]	t=	0.27	0.33	0.38	0.43	0.28	0.35	0.41	0.46	0.60	0.37	0.43	0.49	0.31	0.39	0.45	0.51	0.33	0.41	0.48	0.54
160[2]	t=	0.40	0.50	0.58	0.66	0.43	0.53	0.62	0.70	0.45	0.56	0.66	0.74	0.48	0.59	0.69	0.78	0.50	0.62	0.73	0.82
240[3]	t=	0.55	0.68	0.79	0.90	0.59	0.73	0.85	0.96	0.62	0.77	0.90	1.01	0.65	0.81	0.95	1.07	0.68	0.85	0.99	1.12

s = Stroke [mm]
t = Stroke Time [s]

n_L = Number of links in line
n_T = Number of links total

m = Weight per link [kg]
A = Distance between U-Turns

[1] The chain moves one link with each index

[2] The chain moves two links with each index

[3] The chain moves three links with each index

Technical specifications

Main dimensions

Distance A** [mm]	in increments of 480
Weight at A=2000 [kg]	300
Stroke time** [s]	see Load Table
Stroke** [mm]	80, 160 or 240
Direction	right, left

** Other distances "A", strokes or stroke times by
   request

Loadings

per static link
Force vertical [N]	700
Force horizontal [N]	2600
Tilting moment [Nm]	80
Pull force at the chain [N]	750

Standard Drive

RT160 with 8[1], 4[2] or 8/3[3] Indexes

Precision

in feed direction*
at the drive [mm]	±0.04
opposite the drive [mm]	±0.07
Transverse to feed direction [mm]	±0.05
vertical runout [mm]	±0.03

* for the first and the last link in line we can not
  guarantee this precision.

LF100

A

A + 307

115

311.32

234

351

185 331.5

236

B

F

C

D

E

B

100

M6x18/22 (4x)

50

30

22,5 ±0.01   55 ±0.01

6H7x14 (2x)

120

160

C

The shown drive is a RT160 with brake motor
(Kobold) size IEC71 and wormgear FRS50

Dimensions

The dimensions shown here are the standard
dimensions. Dimension "A" depends on the number
of links. Motion LF Conveyors can either be
mounted on the extruded aluminum, "F" or on the
steel plates "C". The links and the steel plates can
be machined to your specifications. The dimensions

marked with * depend on the size of the drive used.
The conveyor can be delivered without drive or the
drive can be a servo. Special dust covers or rubber
lips between the links are available.

⚠ Caution! Allow space on one side of the index
wheel for adjusting the preload!

A = Distance Between U-Turns

D = Index Wheel

E = The 180° Cam

F = Aluminum Profile System 8-80x120

Load Table LF100

s [mm]	t [s]	n_L= 10 ; n_T= 28 A= 1000mm m [kg]				n_L= 15 ; n_T= 38 A= 1500mm m [kg]				n_L= 20 ; n_T= 48 A= 2000mm m [kg]				n_L= 25 ; n_T= 58 A= 2500mm m [kg]				n_L= 30 ; n_T= 68 A= 3000mm m [kg]			
		0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2
100[1]	t=	0.16	0.19	0.22	0.24	0.18	0.22	0.26	0.29	0.21	0.25	0.29	0.32	0.23	0.28	0.32	0.36	0.25	0.30	0.34	0.39
200[2]	t=	0.24	0.29	0.33	0.37	0.28	0.34	0.39	0.44	0.31	0.38	0.44	0.49	0.35	0.42	0.48	0.54	0.38	0.46	0.52	0.59
300[3]	t=	0.33	0.40	0.46	0.51	0.38	0.46	0.53	0.60	0.43	0.52	0.60	0.67	0.47	0.57	0.66	0.74	0.51	0.62	0.72	0.80

s [mm]	t [s]	n_L= 35 ; n_T= 78 A= 3500mm m [kg]				n_L= 40 ; n_T= 88 A= 4000mm m [kg]				n_L= 45 ; n_T= 98 A= 4500mm m [kg]				n_L= 50 ; n_T= 108 A=5000mm m [kg]				n_L= 55 ; n_T= 118 A=5500mm m [kg]			
		0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2
100[1]	t=	0.26	0.32	0.37	0.41	0.28	0.34	0.39	0.44	0.30	0.36	0.42	0.47	0.31	0.38	0.44	0.49	0.33	0.40	0.46	0.52
200[2]	t=	0.40	0.49	0.56	0.63	0.43	0.52	0.60	0.67	0.45	0.55	0.63	0.71	0.47	0.58	0.67	0.75	0.50	0.60	0.70	0.79
300[3]	t=	0.55	0.67	0.77	0.86	0.58	0.71	0.82	0.92	0.62	0.75	0.87	0.97	0.65	0.79	0.91	1.02	0.68	0.83	0.96	1.07

s = Stroke [mm]
t = Stroke Time [s]

n_L = Number of links in line
n_T = Number of links total

m = Weight per link [kg]
A = Distance between U-Turns

[1] The chain moves one link with each index

[2] The chain moves two links with each index

[3] The chain moves three links with each index

Technical specifications

Main dimensions

Distance A** [mm]	in increments of 500
Weight at A=2000 [kg]	350
Stroke time** [s]	see Load Table
Stroke** [mm]	100, 200 or 300
Direction	right, left

** Other distances "A", strokes or stroke times by request

Loadings

per static link

Force vertical [N]	700
Force horizontal [N]	2600
Tilting moment [Nm]	80
Pull force at the chain [N]	750

Standard Drive

RT160 with 8[1], 4[2] or 8/3[3] Indexes

Precision

in feed direction*

at the drive [mm]	±0.04
opposite the drive [mm]	±0.07
Transverse to feed direction [mm]	±0.05
vertical runout [mm]	±0.03

* for the first and the last link in line we can not guarantee the precision.

877-866-1677

LF125

A

A+372

115

376.64

234

353

185.5   331.5

238

B

F

C

120

C

240

D

E

B

125

M6x18/22 (4x)

50

30

22 ±0.01   80 ±0.01

6H7x14 (2x)

Dimensions

The dimensions shown here are the standard dimensions. Dimension "A" depends on the number of links. Motion LF Conveyors can either be mounted on the extruded aluminum "F" or on the steel plates "C". The links and the steel plates can be machined to your specifications. The dimensions

marked with * depend on the size of the drive used. The conveyor can be delivered without drive or the drive can be a servo. Special dust covers or rubber lips between the links are available.

The shown drive is a RT160 with brake motor (Kobold) size IEC71 and wormgear FRS50

⚠ Caution! Allow space on one side of the index wheel for adjusting the preload!

A = Distance Between U-Turns

D = Index Wheel

E = The 180° Cam

F = Aluminum Profile System 8-80x120

Load Table LF125

s [mm]	t [s]	n_L= 8 ; n_T= 24 A= 1000mm				n_L= 12 ; n_T= 32 A= 1500mm				n_L= 16 ; n_T= 40 A= 2000mm				n_L= 20 ; n_T= 48 A= 2500mm				n_L= 24 ; n_T= 56 A= 3000mm			
		m [kg]				m [kg]				m [kg]				m [kg]				m [kg]			
		0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2
125[1]	t=	0.17	0.20	0.23	0.25	0.19	0.23	0.26	0.29	0.22	0.26	0.29	0.32	0.24	0.28	0.32	0.36	0.26	0.30	0.35	0.39
250[2]	t=	0.25	0.30	0.34	0.38	0.29	0.35	0.40	0.44	0.33	0.39	0.45	0.49	0.36	0.43	0.49	0.54	0.39	0.46	0.53	0.59
375[3]	t=	0.35	0.41	0.47	0.52	0.40	0.48	0.54	0.60	0.45	0.53	0.61	0.68	0.49	0.59	0.67	0.74	0.53	0.63	0.72	0.80

s [mm]	t [s]	n_L= 28 ; n_T= 64 A= 3500mm				n_L= 32 ; n_T= 72 A= 4000mm				n_L= 36 ; n_T= 80 A= 4500mm				n_L= 40 ; n_T= 88 A=5000mm				n_L= 44 ; n_T= 96 A=5500mm			
		m [kg]				m [kg]				m [kg]				m [kg]				m [kg]			
		0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2
125[1]	t=	0.27	0.33	0.37	0.41	0.29	0.35	0.40	0.44	0.31	0.37	0.42	0.46	0.32	0.38	0.44	0.49	0.34	0.40	0.46	0.51
250[2]	t=	0.42	0.50	0.57	0.63	0.44	0.53	0.60	0.67	0.47	0.56	0.64	0.71	0.49	0.58	0.67	0.74	0.51	0.61	0.70	0.78
375[3]	t=	0.57	0.68	0.77	0.86	0.60	0.72	0.82	0.92	0.64	0.76	0.87	0.97	0.67	0.80	0.91	1.02	0.70	0.83	0.95	1.06

s = Stroke [mm]
t = Stroke Time [s]

n_L = Number of links in line
n_T = Number of links total

m = Weight per link [kg]
A = Distance between U-Turns

[1] The chain moves one link with each index

[2] The chain moves two links with each index

[3] The chain moves three links with each index

Technical specifications

Main dimensions

Distance A** [mm]	in increments of 500
Weight at A=2000 [kg]	400
Stroke time** [s]	see Load Table
Stroke** [mm]	125, 250 or 375
Direction	right, left

** Other distances "A", strokes or stroke times by request

Loadings

per static link

Force vertical [N]	700
Force horizontal [N]	2600
Tilting moment [Nm]	80
Pull force at the chain [N]	750

Standard Drive

RT160 with 8[1], 4[2] or 8/3[3] Indexes

Precision

in feed direction*

at the drive [mm]	±0.04
opposite the drive [mm]	±0.07
Transverse to feed direction [mm]	±0.05
vertical runout [mm]	±0.03

* for the first and the last link in line we can not guarantee the precision.

LF150

A

A + 630

150

629.96

272*

511*

314,8   401*

333*

B

F

C

D   E

200

C

467

B

150   M8x18/22 (4x)

80   60

8H7x16 (2x)

32,5 ±0.01   85 ±0.01

Dimensions

The dimensions shown here are the standard dimensions. Dimension "A" depends on the number of links. Motion LF Conveyors can either be mounted on the extruded aluminum "F" or on the steel plates "C". The links and the steel plates can be machined to your specifications. The dimensions

marked with * depend on the size of the drive used. The conveyor can be delivered without drive or the drive can be a servo. Special dust covers or rubber lips between the links are available.

The shown drive is a RT250 with brake motor (Kobold) size IEC80 and wormgear FRS60

⚠ Caution! Allow space on one side of the index wheel for adjusting the preload!

A = Distance Between U-Turns

D = Index Wheel

E = The 180° Cam

F = Aluminum Profile System 8-80x120

Load Table LF150

s [mm]	t [s]	n_L= 8 ; n_T= 28 A= 1200mm m [kg]				n_L= 12 ; n_T= 36 A= 1800mm m [kg]				n_L= 16 ; n_T= 44 A= 2400mm m [kg]				n_L= 20 ; n_T= 52 A= 3000mm m [kg]				n_L= 24 ; n_T= 60 A= 3600mm m [kg]			
		0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2
150[1]	t=	0.28	0.30	0.32	0.34	0.30	0.33	0.35	0.38	0.32	0.35	0.38	0.41	0.34	0.37	0.40	0.44	0.35	0.39	0.43	0.46
300[2]	t=	0.39	0.42	0.46	0.48	0.42	0.46	0.50	0.53	0.45	0.49	0.54	0.57	0.48	0.53	0.57	0.62	0.50	0.56	0.61	0.65
450[3]	t=	0.52	0.56	0.60	0.64	0.56	0.61	0.66	0.70	0.59	0.65	0.71	0.76	0.63	0.69	0.75	0.81	0.66	0.73	0.80	0.86

s [mm]	t [s]	n_L= 28 ; n_T= 68 A= 4200mm m [kg]				n_L= 32 ; n_T= 76 A= 4800mm m [kg]				n_L= 36 ; n_T= 84 A= 5400mm m [kg]				n_L= 40 ; n_T= 92 A=6000mm m [kg]				n_L= 44 ; n_T= 100 A=6600mm m [kg]			
		0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2	0.5	1	1.5	2
150[1]	t=	0.37	0.41	0.45	0.49	0.39	0.43	0.47	0.51	0.40	0.45	0.50	0.54	0.42	0.47	0.52	0.56	0.43	0.49	0.54	0.58
300[2]	t=	0.52	0.58	0.64	0.69	0.55	0.61	0.67	0.73	0.57	0.64	0.70	0.76	0.59	0.66	0.73	0.79	0.61	0.69	0.76	0.82
450[3]	t=	0.69	0.77	0.84	0.91	0.72	0.81	0.88	0.96	0.75	0.84	0.92	1.00	0.78	0.87	0.96	1.04	0.81	0.91	1.00	1.09

s = Stroke [mm]
t = Stroke Time [s]

n_L = Number of links in line
n_T = Number of links total

m = Weight per link [kg]
A = Distance between U-Turns

[1] The chain moves one link with each index

[2] The chain moves two links with each index

[3] The chain moves three links with each index

Technical specifications

Main dimensions

Distance A** [mm]	in increments of 600
Weight at A=2000 [kg]	800
Stroke time** [s]	see Load Table
Stroke** [mm]	150, 300 or 450
Direction	right, left

** Other distances "A", strokes or stroke times by request

Loadings

per static link

Force vertical [N]	1250
Force horizontal [N]	2600
Tilting moment [Nm]	120
Pull force at the chain [N]	900

Standard Drive

RT160 with 8[1], 4[2] or 8/3[3] Indexes

Precision

in feed direction*

at the drive [mm]	±0.04
opposite the drive [mm]	±0.07
Transverse to feed direction [mm]	±0.05
vertical runout [mm]	±0.03

* for the first and the last link in line we can not guarantee the precision.

877-866-1677

Inquiry and order form for Motion LF conveyor

Company _____

Contact person _____

Tel. / Fax _____

Email Address _____

Project no. / Order no. _____

Date _____

Type

☐ LF080

☐ LF100

☐ LF125

☐ LF150

☐ other type _____

Distance A [mm] _____

Number of links in line n_L _____

Stroke (1 x. 2 x or 3 x length of one link) _____

☐ vertical assembly (using links on top)

☐ horizontal assembly (using links on both sides)

Mode of motion

☐ Stop mode (Fixed index time, Variable dwell time)

   index time _____

☐ Continuous mode (Fixed index and dwell time)

   Number of cycles per minute _____

   Ratio index time : dwell time (or angle) _____

Payload

Weight of tooling _____

Weight of tooling _____

Distance from center point of mass of payload

to surface of the link _____

vertical assembly

horizontal assembly

A

n_L=10
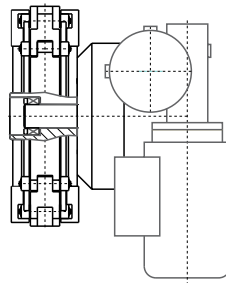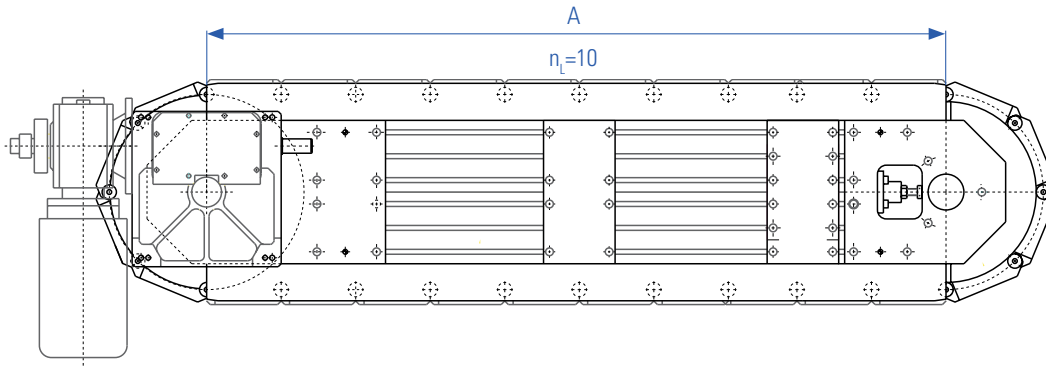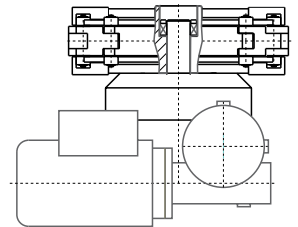
Inquiry and order form for Motion LF conveyor

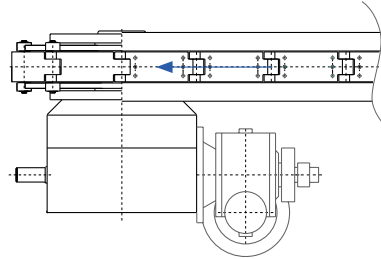## Possible mounting positions for the drive units
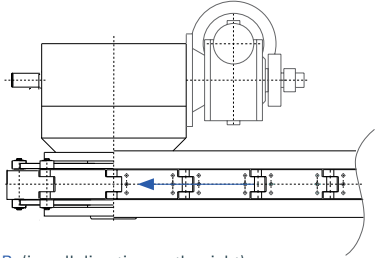
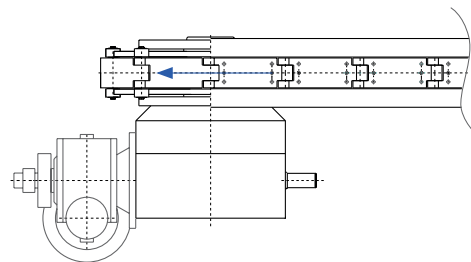R (in pull direction on the right)
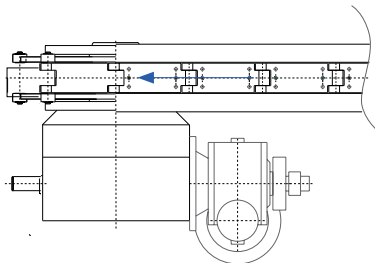
L (in pull direction on the left)

Position of the free drive shaft

A (drive shaft to the outside)

I (drive shaft to the inside)

Drive

☐ With indexer

    Mounting position of drive ☐ L ☐ R

    Position of the free drive shaft ☐ A ☐ I

    Motor voltage ☐ 277/480V 60Hz

               ☐ 230/400V 50Hz

               ☐ other _____

Brake Voltage ☐ 24V DC
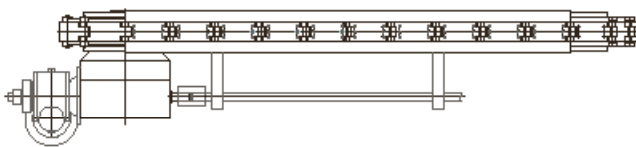
               ☐ 230V AC

               ☐ 400V AC

               ☐ other _____

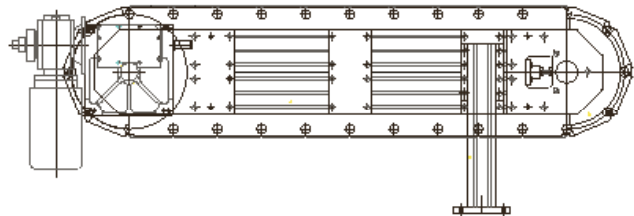Safety clutch at the drive ☐ yes ☐ no

☐ Without drive

☐ With custom specified drive _____

Accessories

☐ Synchronously running shaft - drawing #: _____

☐ Machine feet (only at vertical assembly)

    Number _____

    Distance between floor and upper link _____

Allen Bradley PLC

Allen Bradley PLC ☐ Yes ☐ No