

Conveyor Line CX-400 Belt Conveyor Operation and Maintenance Manual

CX-400

Nordwind Systems

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S3. GENERAL

The CX-400 is a modular-frame belt conveyor with a 400 mm belt width, manufactured by Nordwind Systems. The conveyor is driven by a 3-phase induction motor rated at 2.2 kW, 380-415 V / 50 Hz, housed in an IP54 enclosure, and belt speed is continuously variable from 0.2 to 1.8 m/s by means of a variable frequency drive (VFD). The frame is fabricated from powder-coated steel and is fitted with adjustable legs providing an installed height range of 750 to 950 mm. The maximum permissible load is 35 kg per meter of belt and must not be exceeded under any circumstances. The standard unit is supplied with an IP54 protection rating; an IP65 option is available for washdown applications and must be confirmed with the sales department before quotation.

Objectives

- Provide continuous, speed-controlled belt transport of material within the rated load limit of 35 kg per meter of belt.
- Permit flexible line layout and installation height adjustment through the modular frame and adjustable legs (750-950 mm).
- Allow the conveying speed to be matched to the process by VFD control over a range of 0.2 to 1.8 m/s.
- Maintain safe operation through fixed guarding, interlocks, and an emergency stop function that is verified at the start of every shift.

Key Specifications

Item	Value
Model	CX - 400 belt conveyor, modular frame
Belt width	400 mm
Motor	3 - phase induction, 2.2 kW
Motor supply	380 - 415 V / 50 Hz
Enclosure rating	IP54 standard; IP65 available as an option (confirm with sales)
Maximum load	35 kg per meter of belt (must not be exceeded)
Belt speed	Variable, 0.2 - 1.8 m/s via VFD
Frame	Powder - coated steel
Leg height adjustment	750 - 950 mm
Installation levelling tolerance	+ / - 2 mm across full conveyor length
Belt tension setting	45 - 55 on the tensioner gauge scale
Bearing grease specification	Lithium NLGI 2 (do not over - grease)

Power & Utilities

- 3-phase facility supply, 380-415 V / 50 Hz, feeding a disconnect switch, then the VFD, then the motor.
- Dedicated circuit with breaker rating matched to the motor nameplate; breaker sizing is not specified in this packet and must be confirmed on site by a qualified electrician. [NEEDS REVIEW]

S4. SAFETY WARNINGS

DANGER: Lockout/Tagout Required Before Servicing

Lockout/tagout is REQUIRED before any maintenance, guard removal, or belt adjustment. A minimum of two workers is required for lockout/tagout verification.

WARNING: Pinch Point at Drive Pulley and Idler Rollers

Pinch points exist at the drive pulley and at all idler rollers. Keep hands clear during operation.

WARNING: Do Not Operate With Guards Removed or Interlocks Bypassed

Do not operate the conveyor with guards removed or with interlocks bypassed. The emergency stop must be tested at the start of every shift.

WARNING: Hot Surfaces on Drive Components

The belt can reach a high temperature during sustained heavy load. Allow the unit to cool down before touching drive components.

WARNING: Do Not Exceed Maximum Load Rating

The maximum load rating of 35 kg per meter of belt is not to be exceeded. Overloading causes belt tracking failure and possible motor burnout.

S5. OPERATION

Pre-operation Checklist

- Test the emergency stop function at the start of every shift.
- Visually inspect the belt for wear or fraying before starting the line.
- Confirm that all guard panels are fitted and that no interlock is bypassed.
- Confirm that the material to be conveyed will not exceed the maximum load of 35 kg per meter of belt.
- Confirm that the belt tension gauge reads within 45-55 on the tensioner scale.
- Confirm that the pulley face is free of oil or grease contamination before loading the belt. (general safety practice) [NEEDS REVIEW]

Operating Procedure

1. Apply lockout/tagout to the conveyor and verify isolation with a second worker before beginning any mechanical installation, guard removal, or belt adjustment work.
→ Power supply is isolated, the tag is in place, and two workers have independently confirmed the isolation.
2. Anchor the frame legs to the floor at the installation location.
→ All legs are securely fastened and the frame does not move when pushed by hand.
3. Check the frame level with a spirit level across the full length of the conveyor.
→ Level deviation is within a tolerance of +/- 2 mm across the full length.
4. Mount the drive unit onto the frame.
→ The drive unit is seated on its mounting points with no visible gap or misalignment.
5. [NEEDS REVIEW] Torque the drive unit mounting bolts to the specified value.
→ [NEEDS REVIEW] The torque specification sheet is missing from the source packet; obtain the specified torque value before performing this step.
6. Install the belt onto the drive pulley and idler rollers.
→ The belt is seated centrally on all rollers with no twist.
7. Adjust the belt tension using the tensioner.
→ The tensioner scale gauge reads between 45 and 55.
8. [NEEDS REVIEW] Wire the motor in accordance with the wiring diagram.
→ [NEEDS REVIEW] The wiring diagram is referenced as an appendix but is not included in the source packet; obtain the diagram before wiring. Facility supply must be a dedicated circuit with the breaker rating confirmed on site by an electrician against the motor nameplate.
9. Test the emergency stop function before starting the test cycles, as required at the start of every shift.
→ The conveyor stops immediately when the emergency stop is actuated and cannot be restarted until the emergency stop is reset.
10. Run a test cycle with the conveyor empty for 15 minutes.
→ The conveyor runs for the full 15 minutes without stopping or tripping.
11. Check the belt tracking during and after the empty test cycle.
→ The belt runs centrally and does not drift toward either side of the frame.
12. Run a test cycle at 25% of rated load for 15 minutes.
→ The conveyor runs for the full 15 minutes at 25% load with stable tracking and no abnormal noise.
13. Run a full load test without exceeding the maximum load rating of 35 kg per meter of belt.
→ The conveyor carries the full rated load without belt slip, tracking drift, or motor trip.
14. Log the vibration readings taken during the full load test.
→ Vibration readings are recorded in the commissioning record for future comparison.

S6. MAINTENANCE

Interval	Component	Action
Daily	Belt	Visually inspect for wear and fraying
Daily	Emergency stop	Check e - stop function
Weekly	Bearings	Lubricate with lithium NLGI 2 grease; do not over - grease
Monthly	Belt tension	Check belt tension against the tensioner gauge scale
Monthly	Idler rollers	Inspect rollers for freeness of rotation
Monthly	Frame bolts	Perform torque check
Quarterly	Drive train	Perform full inspection and replace any bearings showing play
Annual	VFD	Perform full parameter backup and inspection by a qualified electrician

S7. PURCHASING LIST FOR EQUIPMENT

No.	Name	Manufacturer	Model	Spec	Qty	Notes
1	Drive pulley assembly				1	
2	Idler roller			Quantity varies by conveyor length; not specified in source material [NEEDS REVIEW]	1	[NEEDS REVIEW]
3	Belt			Food - grade PVC or general purpose, selected according to the application; final material selection not fixed in source material	1	[NEEDS REVIEW]
4	VFD unit			Matched to motor rating (2.2 kW, 380 - 415 V / 50 Hz)	1	
5	Frame leg			Adjustable, 750 - 950 mm; quantity given for 4 m standard length	6	
6	Guard panel			Quantity not stated in source material [NEEDS REVIEW]	1	[NEEDS REVIEW]

S8. DRAWINGS

[Drawing] Motor wiring diagram (referenced as an appendix in the source material; drawing not included in this packet) [NEEDS REVIEW]

S9. EQUIPMENT MANUALS

3-Phase Induction Motor

2.2 kW, 380-415 V / 50 Hz, IP54 enclosure. Wired to the VFD in accordance with the motor wiring diagram. Breaker sizing for the dedicated supply circuit is to be confirmed on site by a qualified electrician against the motor nameplate.

Variable Frequency Drive (VFD)

Matched to the motor rating and used to vary belt speed from 0.2 to 1.8 m/s. Fault codes should be read from the VFD when the motor trips on start. VFD parameters are to be backed up and the unit inspected annually by a qualified electrician.

Belt Tensioner

S10. TROUBLESHOOTING

Symptom	Cause	Action
The belt drifts to one side of the frame.	Uneven belt tension is the most common cause; tracking adjustment is out of alignment.	Check and adjust the tracking adjustment bolts on the tail pulley and correct the belt tension.
The motor trips on start - up.	Overcurrent, likely caused by jammed rollers or an incorrect acceleration ramp setting in the VFD.	Read the VFD fault code, free any jammed rollers, and verify the acceleration ramp setting.
Unusual noise comes from the drive.	Probable bearing failure in the drive train.	Stop the conveyor immediately and inspect for bearing failure. Do not run the machine to failure.
The belt slips under load.	Insufficient belt tension, or oil/grease contamination on the pulley face.	Check the belt tension first, then inspect the pulley face for oil or grease contamination and clean it.
Repeated belt tracking failure and motor overheating or burnout.	The maximum load rating of 35 kg per meter of belt has been exceeded.	Reduce the conveyed load to within the 35 kg per meter rating and inspect the belt and motor for damage before returning the conveyor to service.
Bearings show play during inspection.	Normal wear of the drive train bearings.	Replace any bearing showing play as part of the quarterly full drive train inspection.

S11. GLOSSARY

Term	Definition
VFD (Variable Frequency Drive)	The drive unit that varies the belt speed over a range of 0.2 to 1.8 m/s and is matched to the motor rating. It also reports fault codes and holds parameters that are backed up annually.
LOTO (Lockout/Tagout)	The mandatory energy isolation procedure applied before any maintenance, guard removal, or belt adjustment. A minimum of two workers is required for LOTO verification.
E - stop (Emergency Stop)	The emergency stop device, which must be function tested at the start of every shift and whose function is also checked during daily visual inspection.
IP54	The standard enclosure protection rating of the CX - 400 motor and of the conveyor as supplied.
IP65	A higher enclosure protection rating available as an option for washdown applications; sales must be consulted before quoting.
Pinch point	A location where body parts can be trapped, present at the drive pulley and at all idler rollers. Hands must be kept clear during operation.
Drive pulley	The driven pulley assembly that transmits motor torque to the belt; supplied as one assembly per conveyor.
Idler roller	A free - turning roller supporting the belt; inspected monthly for freeness. The quantity varies with conveyor length.
Tail pulley	The pulley carrying the tracking adjustment bolts used to correct belt drift.
Belt tracking	The lateral running position of the belt on the pulleys and rollers, checked during the empty test cycle and corrected via the tail pulley adjustment bolts.
Tensioner scale reading	The belt tension value read from the tensioner gauge; the correct installation range is 45 to 55.
Lithium NLGI 2 grease	The specified bearing lubricant applied weekly. Over - greasing must be avoided.
Disconnect switch	The isolating switch installed between the VFD and the facility supply in the electrical chain motor - VFD - disconnect switch - facility supply.
Maximum load rating	The maximum permissible conveyed load of 35 kg per meter of belt, which must not be exceeded.

S12. REVISION HISTORY

[NEEDS REVIEW: Add revision history — the source material contains no revision history information]