CB-002N Circuit Board

Provides Thermal Protection for board and motor

- Built-in current limiter
- Error Output signal for self diagnosis
- Dynamic brake control
- Variable speed (25% - 100%) by onboard or remote potentiometer

www.itohdenki.com
info@itohdenki.com
Ph: 570.820.8811
Fax: 570.820.8838

ITOH DENKI, USA, INC.
135 Stewart Road
Hanover Industrial Estates
Hanover Township, PA 18706

rev09-0423

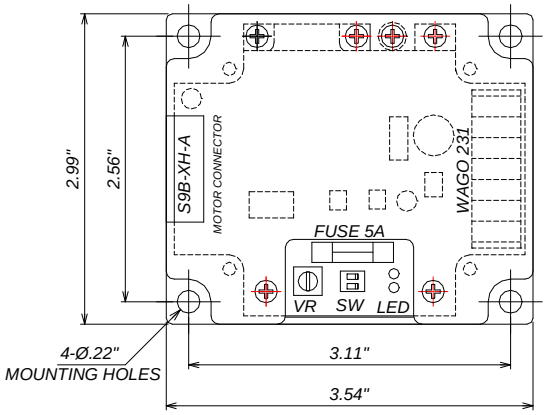
CB-002N SPECIFICATIONS

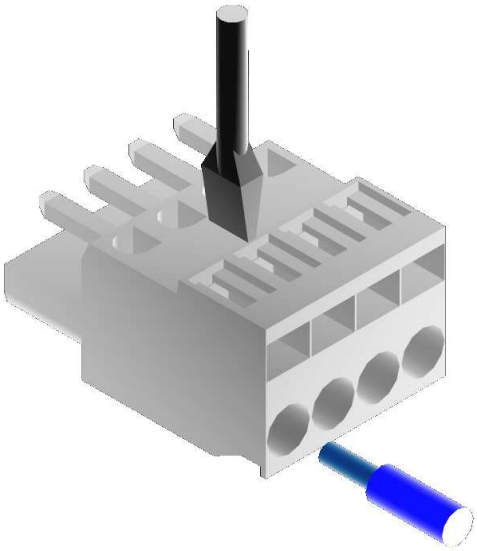
Input Voltage	24V DC ±10%
Nominal Operating Voltage	24VDC: Battery or fullwave rectified and smoothed current <10% Ripple
Overload Protection	Built-in Current Limiter: 2.3 – 3.2A depending on the nominal speed (current) of the unit Thermal Overload Protector: Reacts at critical temperature either at 70° C (158° F) on the PCB, or at 105° C (221° F) in the motor, and will reduce the motor output torque to prevent motor burnout. The motor torque will recover after cool off. 5A fuse to power supply, power supply protection Diode: protects the PCB from incorrect wiring Resistance to surge Peak current protection (6A)
Speed Variation	25 – 100% of the peripheral velocity by adjusting the built-in potentiometer (VR), or by external speed control PWM (Pulse Width Modulation) system
Control Terminals	Power: 24VDC is supplied between #1 (+24VDC) and #2 (0V) Start/Stop: Place ON/OFF switch between #2 and #3 Change DIR: closed between #2 and #4 External speed control: Potentiometer (50kΩ) between #5 and #6 or 10-0V DC (min to max) to input #5 12V pull-up voltage (4.7kΩ) on terminals 3, 4, & 7 Error (overload) output: NPN (0V)

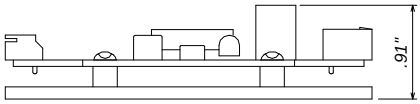
Dip Switches

Function	**DIP Switch**	**ON (default)**		**OFF**	
Speed control	SW1	Internal		External	
Direction control	SW2	CB-002N	CB-002P	CB-002N	CB-002P
		CW – FS CCW – FE	CCW – FS CW – FE	CCW – FS CW – FE	CW – FS CCW – FE

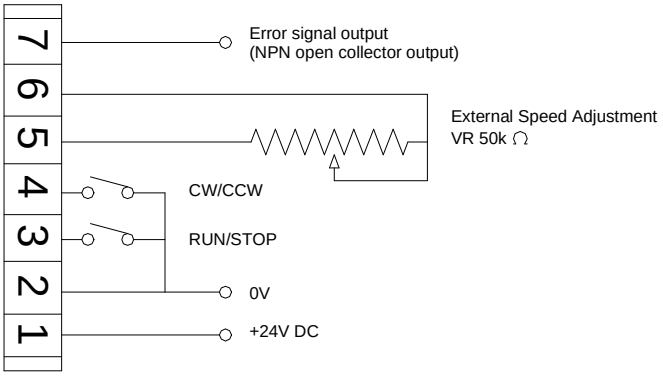
Error Indication	LED (Green – Powered; Red – Overload)
Applicable Environment	Temperature: 0 – 40° C (32 – 104° F) Thermal Overload Protection may react depending on the operating conditions. Humidity: <90% Relative Humidity (no condensation) Atmosphere: No corrosive gasses Vibration: 0.5G



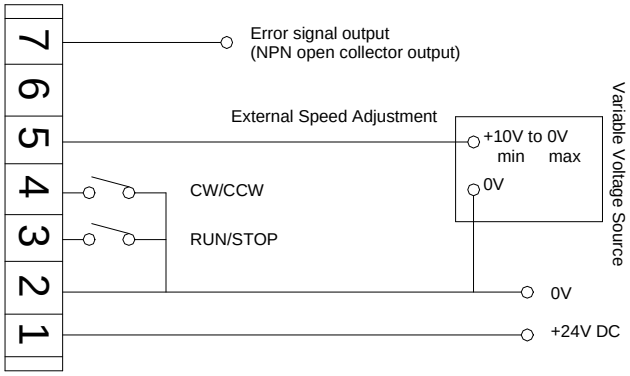




Press down spring clamp in connector with screwdriver.
Insert leads in proper order.
Lead should be stripped approx: .31-.35”
WAGO connector (included) must be inserted and/or pulled out carefully, so as not to damage other parts.



DIP swtich 1 is set OFF; VR1 set maximum (fully CW)



DIP swtich 1 is set OFF; VR1 set maximum (fully CW)

WAGO connector wiring diagram

Terminals 5 & 6 are used only when PM speed is to be controlled by an external potentiometer
Terminal 5 when using a variable DC voltage source

WAGO female connector # 231-107/026-000
Minimum wire gauge – 28 AWG
Maximum wire gauge – 14 AWG

Precautions
Note – Over-speeding of the roller’s no-load speed by more than 50% may cause damage.
Conveyor should be grounded

Warning

Installation Precautions – **IMPORTANT, PLEASE READ BEFORE INSTALLATION**

Precaution	Action	Reason
Multiple power supplies	0V line of all power supplies on the same conveyor line (powering the card/rollers, & controls) need to be physically linked together.	This completes the signal path from one section of the conveyor (powered by a power supply) to the adjacent section of conveyor (powered by another power supply) and allows for proper communication through the cable and external interfaces.
Voltage drop across the power bus	Use suitable gauge wire in relation to distance and current draw to prevent voltage drop. Operating DC voltage is 24V ±10%	When running long distances from a DC power supply, the voltage drop during motor operation across the power bus may be significant (may drop below 15V!). If there is a large enough drop in voltage, the roller(s) may behave in a strange manner. In order to prevent this, a larger gauge wire must be used.
Grounding	Ensure the control card is securely grounded to the conveyor frame. The conveyor frame should also be at the same potential reference as earth ground. Standard grounding practices should be followed.	Static discharge may interfere and damage internal components.
Electrical	24V DC ±10% 4A maximum current limiter (motor lock is 4A) Diode protection for miswiring Sensor power short circuit protection 5A fuse for power supply protection	Improper power will damage the card. The motor/card should not be subject to locked conditions repeatedly. Internal fuse is not replaceable. If the fuse has blown, more serious damage has occurred within the card/motor.
Environment	Ambient temperature is 32~104℉ Ambient humidity is < 90%RH Atmosphere has no corrosive gas Vibration is < 0.5G Indoor use only	Extreme environmental variables may cause poor or no performance and damage the card.
Over-speeding	Over-speeding of the roller's no-load speed by more than 50% may cause damage.	Back EMF will be generated.

Revision History

Revision Number	Change
A-12.19.02	Initial document
A-10.29.03	Under “Control Terminals” on page 2, added “(-12V)” to the end of “Error (overload) signal output: #7”
A-11.19.03	Under “Input Voltage” on page 2, updated voltage range
08-0108	Changed revision number format to match other Itoh Denki USA, Inc. documentation Added Page numbering to Footer Under “Speed Variation” on page 2, shortened wording for external speed control Under “Control Terminals” on page 2, updated DIR, External speed control, terminal voltages, and Error output type Under “DIP Switches” on page 2, updated functions, settings, and set in table Cleaned up page 3 and added new wiring diagram Added “Revision History” table to page 4
08-0718	Added CB-002P direction on dip switch SW2 on page 2
09-0423	Added precautions