
RD5

Installation Guide



September 2019

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1. Technical Information

1.1 Physical Specifications

Feature	Units	All Types
Weight	g	650g
Dimension	mm	124 x 118 x 73.2
Mounting method		Panel

1.2 Technical Data

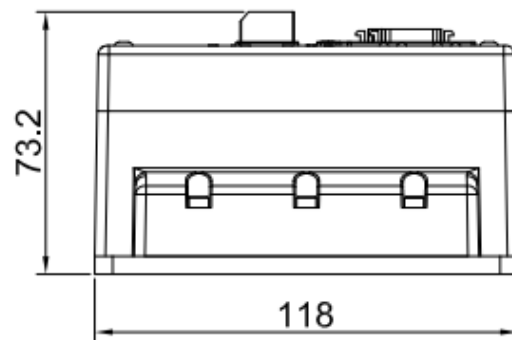
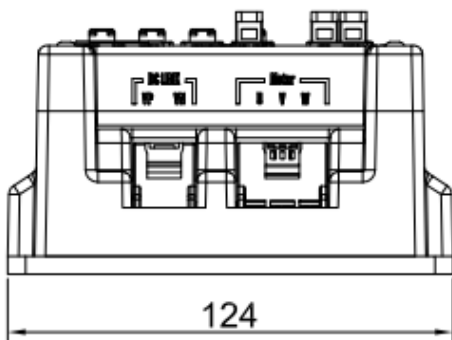
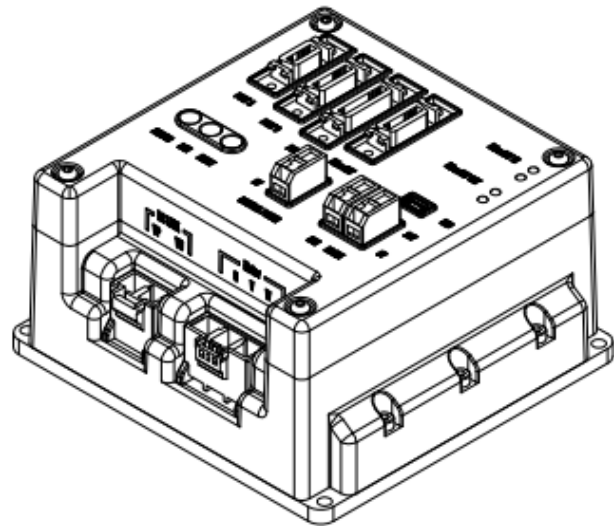
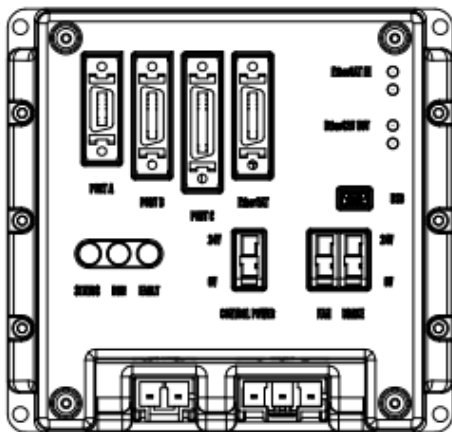
Feature	Units	RD5-025400
Minimum supply voltage	VDC	48
Nominal supply voltage	VDC	144
Maximum supply voltage	VDC	400
maximum continuous power output	kW	1.87kW
Efficiency at rated power(at nominal conditions)	%	-
Control power supply	VDC	18 to 30 VDC
Brake, Fan power output	VDC	24
Continuous current limit	A(peak)	13
Peak current limit	A(peak)	25

1.3 Environmental Conditions

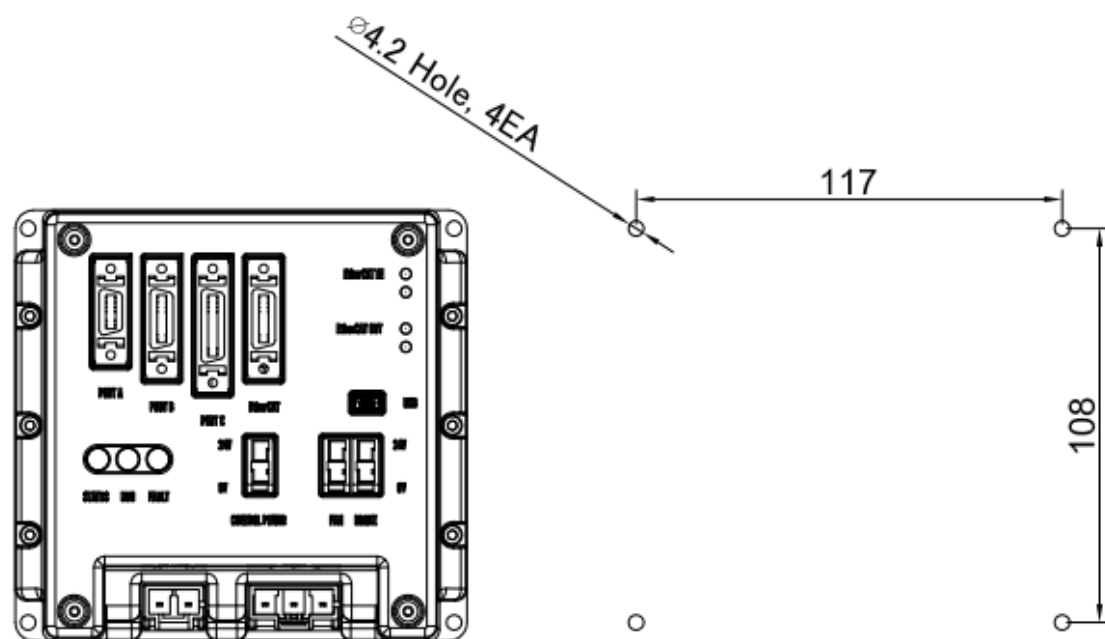
Feature	All Types
Operating ambient temperature	0°C to 40°C
Storage temperature	-20°C to +85°C
Maximum non-condensing humidity	-
Maximum Operating Altitude	-
Mechanical Shock	-
Vibration	-

2. Installation

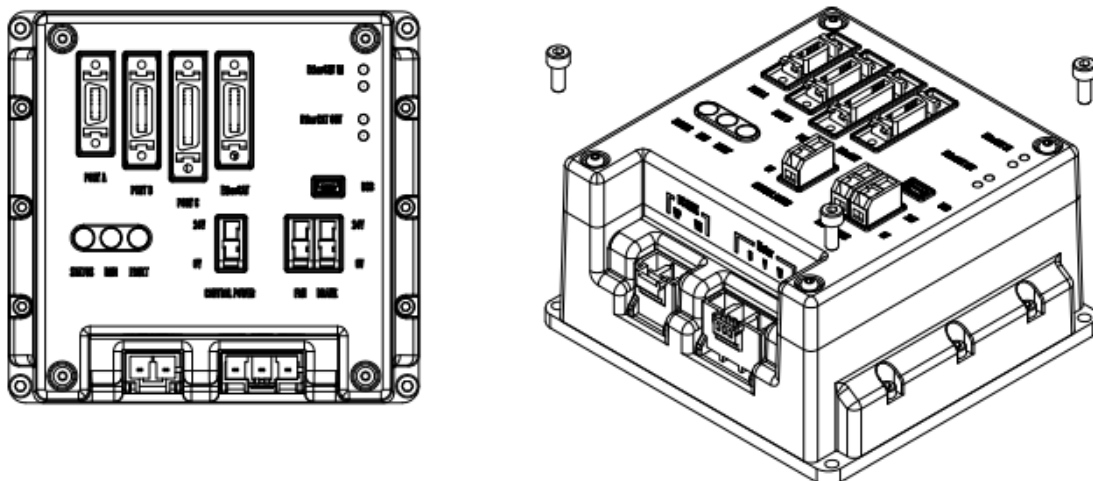
2.1 Drive Dimensions



2.2 Mounting Footprint

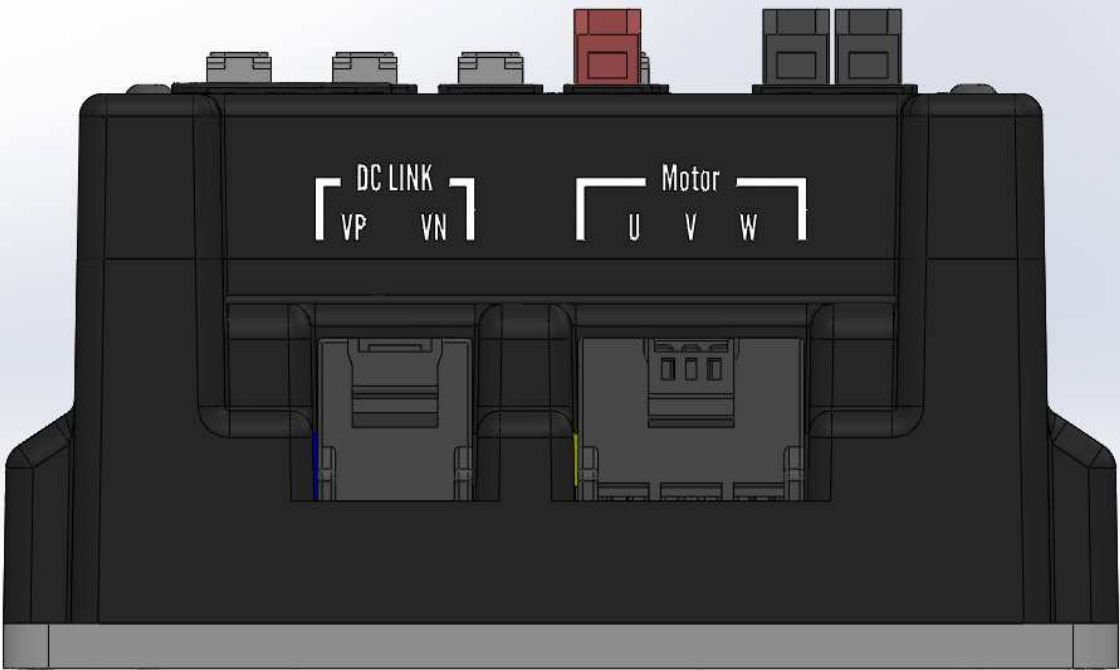


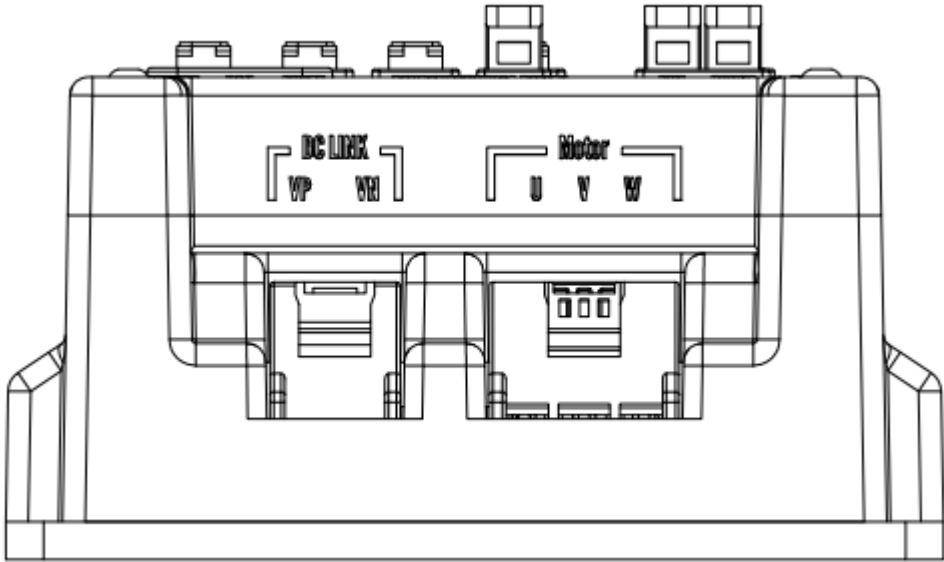
M4 * 10mm Bolt x 4



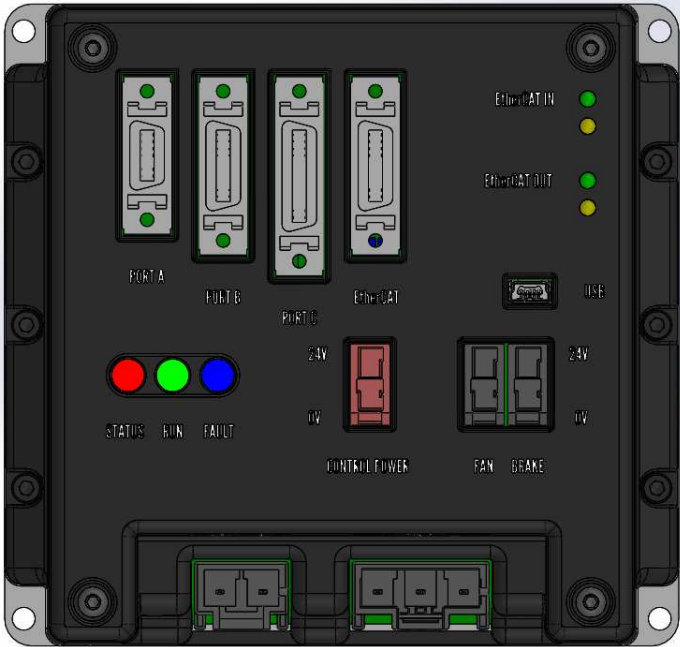
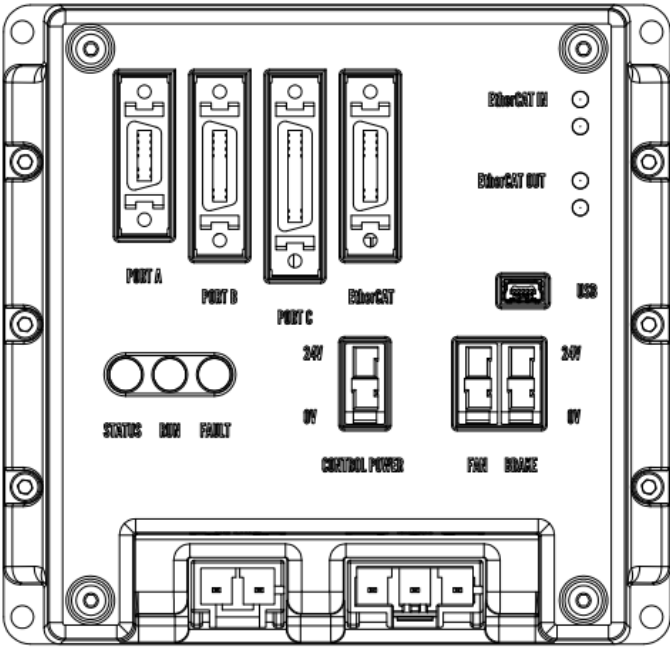
2.3 Connector Type

Front View





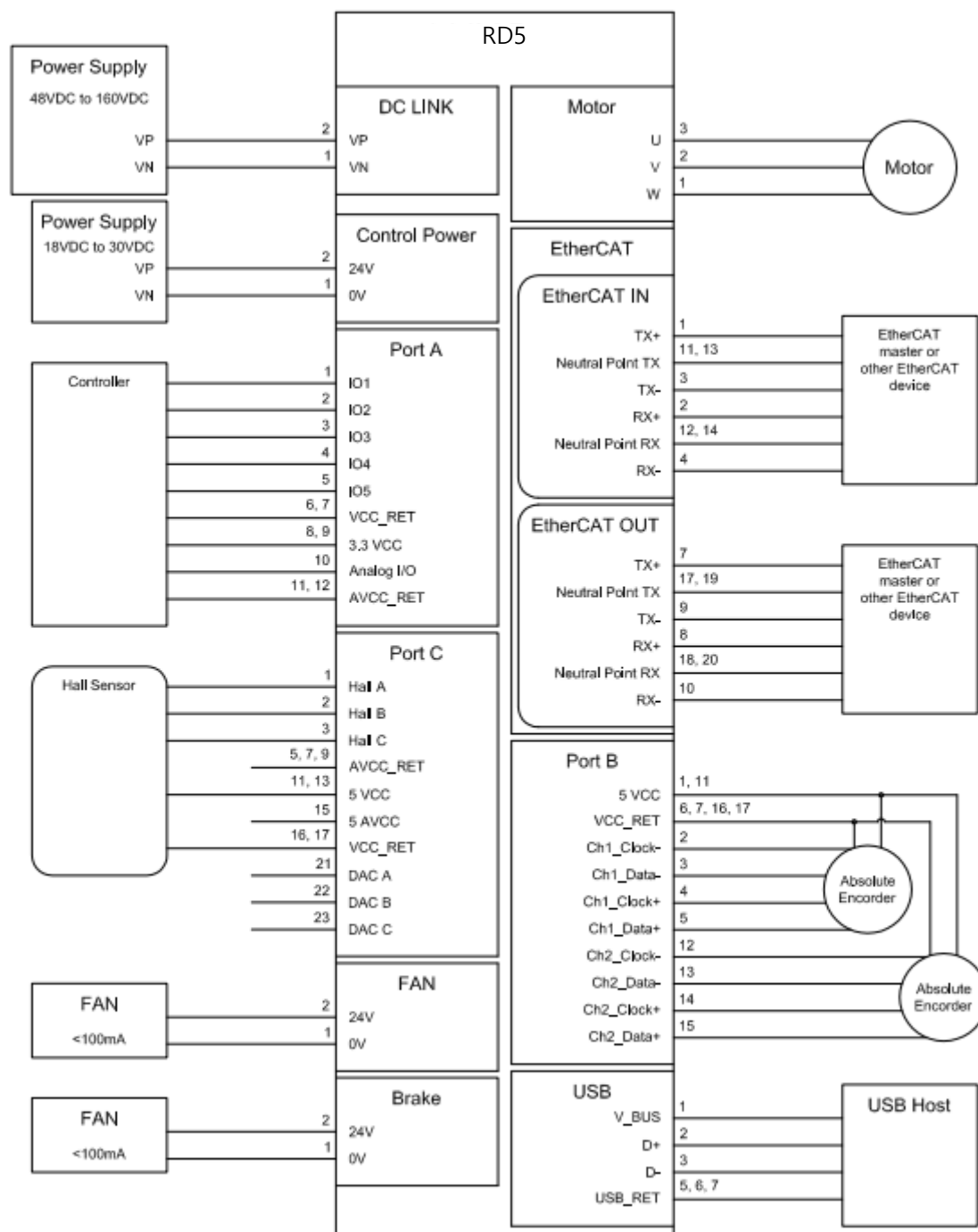
Type		Port Name	Function
Hirose	(Mate with DF22R-2S-7.92C)	DC LINK	DC LINK Power Input
Hirose	(Mate with DF22R-3S-7.92C)	Motor	Motor 3 Phase

Top View		
		
		
Type	Port Name	Function
3M (Mate with 10114-3000PE)	Port A	I/O
3M (Mate with 10120-3000PE)	Port B	Feedback
3M (Mate with 10126-3000PE)	Port C	Feedback

3M (Mate with 10120-3000PE)	EtherCAT	EtherCAT
USB Mini B Type Plug	USB	USB
Molex (Mate With 151049-2209)	Control Power	Control Power Input
Molex (Mate With 151049-2206)	FAN	FAN 24V Output
Molex (Mate With 151049-2206)	Brake	Brake 24V Output

2.4 Connection Diagram

The following describes the connection diagrams for the RD5.



3. Wiring

3.1 Motor Power Connector Pinouts

-Mate With DF22R-3S-7.92C(Hirose).

-Use a 14 AWG twisted triple shielded cable.

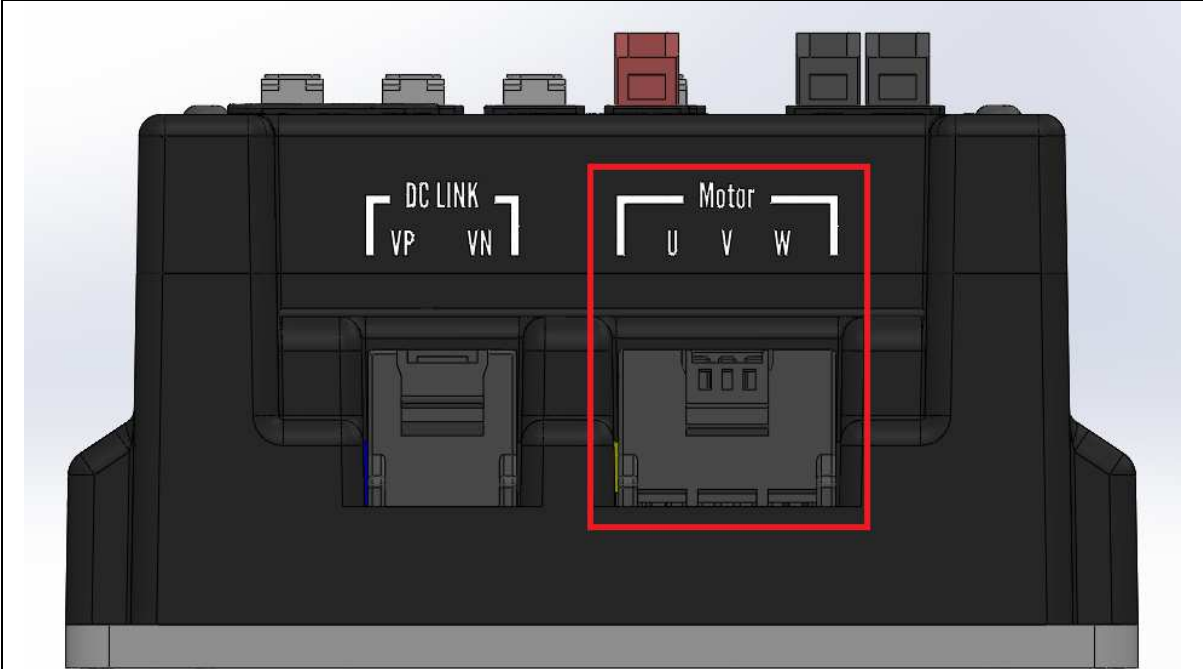
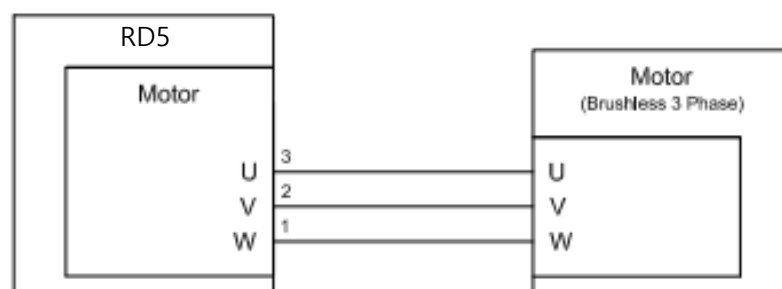
Connector	Motor	
Pin	Name	Function
1	W	Motor W Phase
2	V	Motor V Phase
3	U	Motor U Phase
Connector Pin Position		
		

Figure 3.1-1 describes the wiring diagram for the Motor power connections.



<Figure 3.1-1>

3.2 DC LINK Power

-Mate With DF22R-2S-7.92C(Hirose).

-DC LINK Power Input range = $48V \leq V_{DCLINK} \leq 400V$.

-Use a - AWG twisted pair shielded cable.

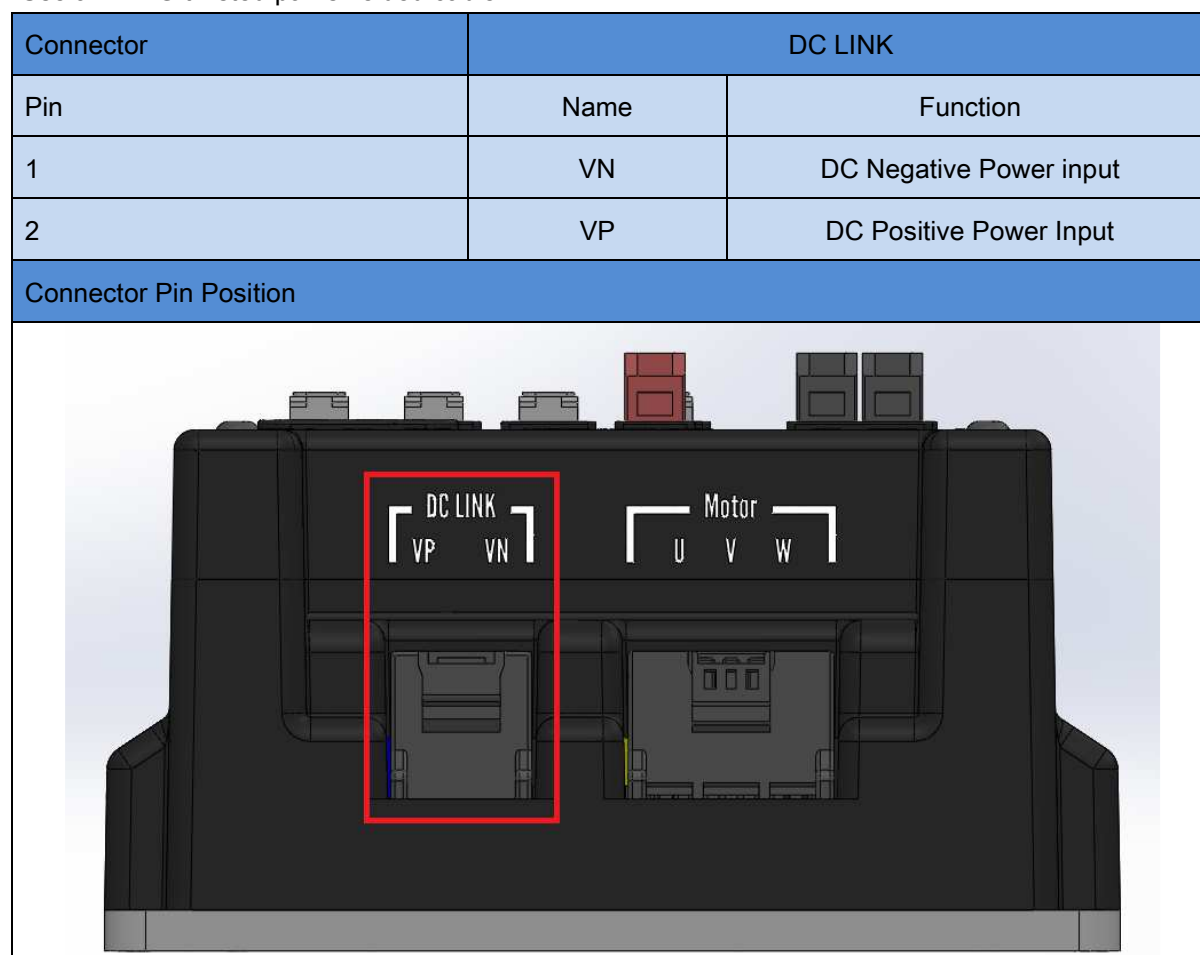
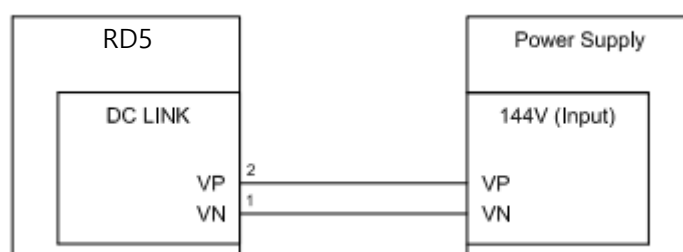


Figure 3.2-1 describes the wiring diagram for the DC LINK connections.



<Figure 3.2-1>

*DC LINK Power Input range = $48V \leq V_{DCLINK} \leq 400V$

*Normal Input = 144V

*DC LINK Power Current Consumption = $I_{DCLINK}(\text{peak to peak}) \leq -A(\text{Peak Current})$

3.3 Control Power

-Mate With 151049-2209 (Molex).

-Control Power Input range = $18V \leq V_{\text{control}} \leq 30V$.

-Use a 24 AWG twisted pair shielded cable.

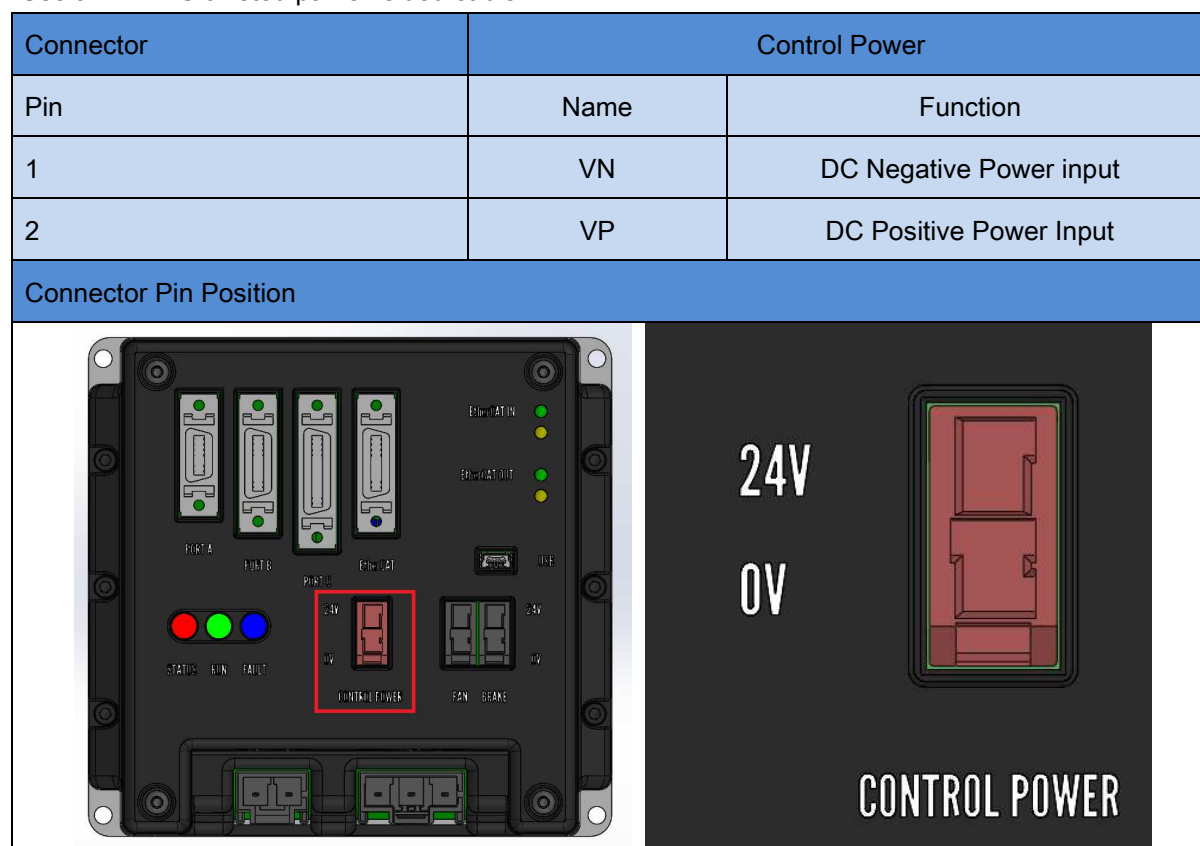
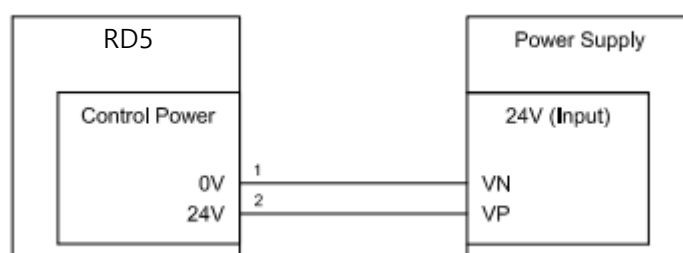


Figure 3.3-1 describes the wiring diagram for the Control power connections



<Figure 3.3-1>

*Control Power Input range = $18V \leq V_{\text{control}} \leq 30V$

*Control Power Current Consumption = $170mA \leq I_{\text{control}} \leq 400mA$ (EtherCAT Operating)

3.4 Fan

- Mate With 151049-2206 (Molex)
- DC Power output voltage = 24V
- Use a 22 AWG twisted pair shielded cable.

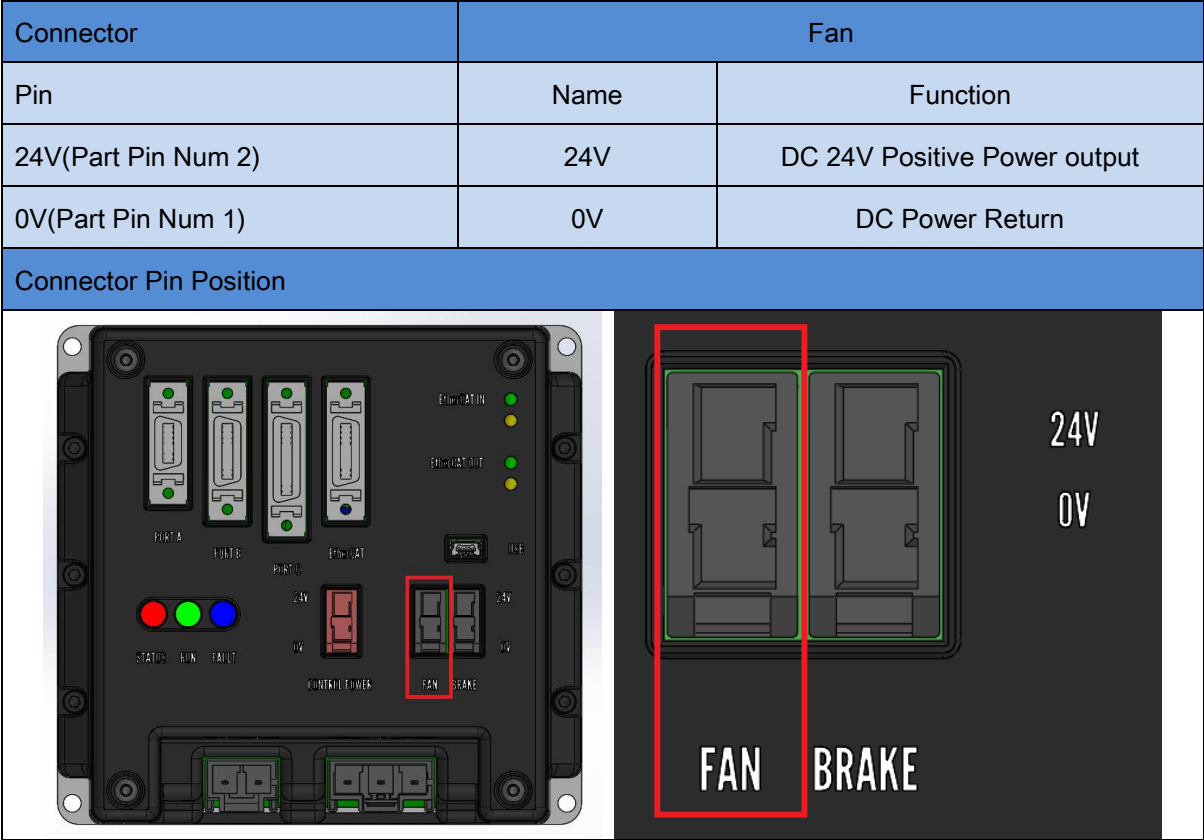
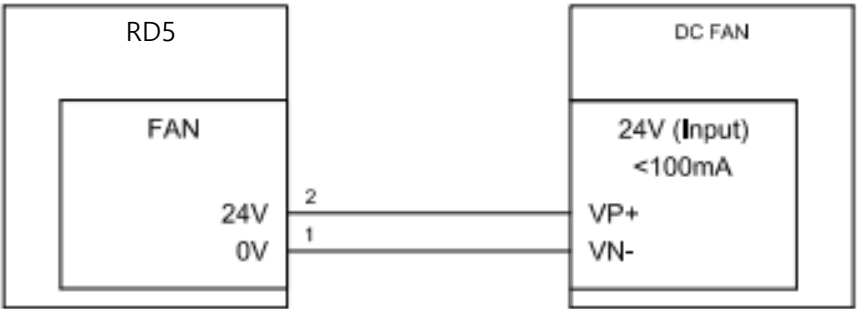


Figure 3.4-1 describes the wiring diagram for the Fan connections.



<Figure 3.4-1>

*Active current = $I_{fan} \leq 100\text{mA}$

3.5 Brake

- Mate With 151049-2206 (Molex)
- DC Power output voltage = 24V
- Use a 22 AWG twisted pair shielded cable.

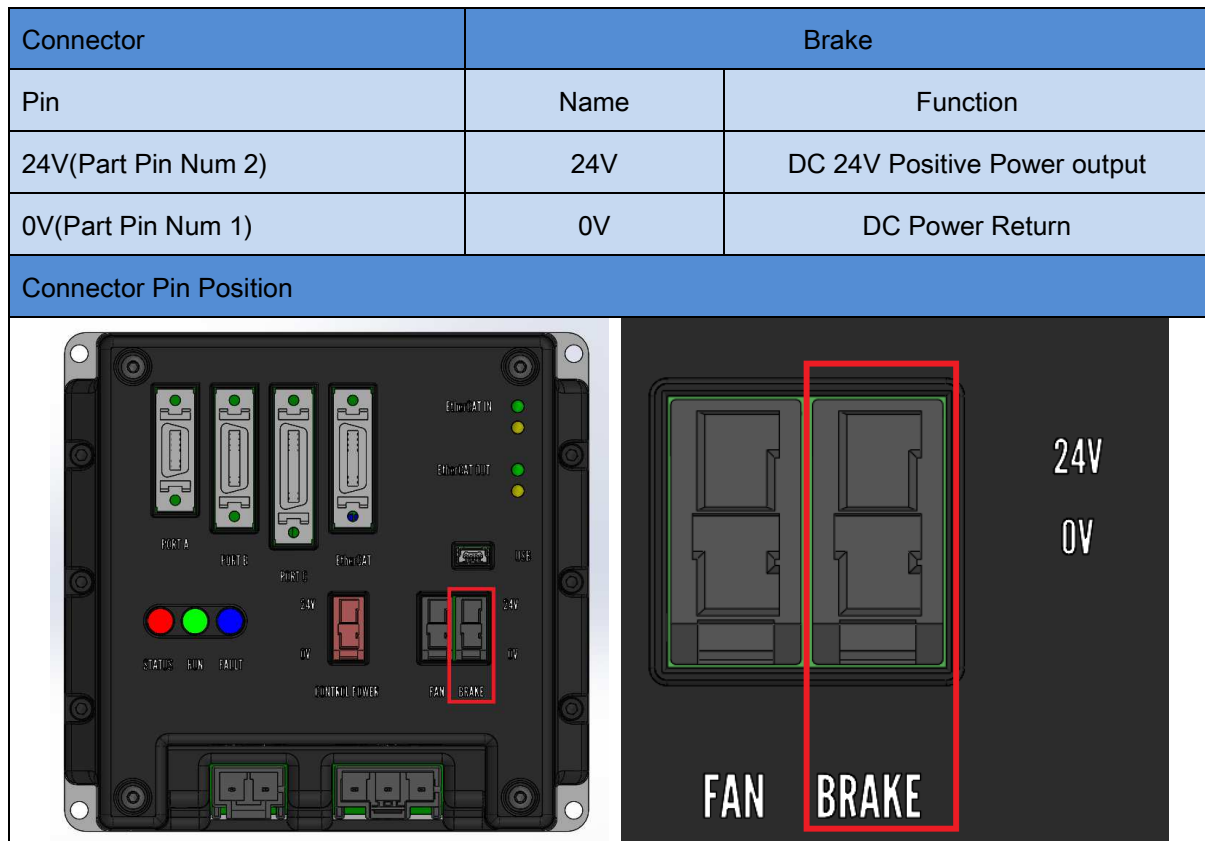
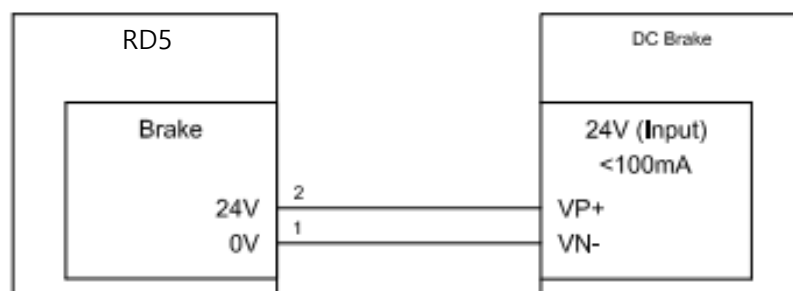


Figure 3.5-1 describes the wiring diagram for the Brake connections.



<Figure 3.5-1>

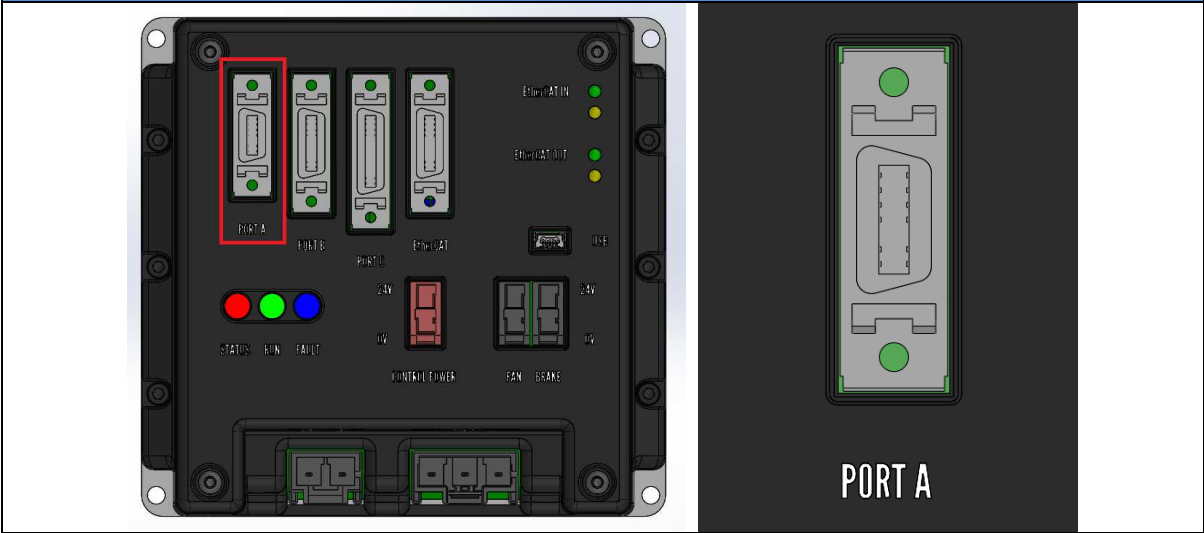
*Active current = $I_{\text{brake}} \leq 100\text{mA}$

3.6 Port A

- Mate With 10114-3000PE (3M).
- Port A supports IO Channel.
- Use a 26 AWG twisted pair shielded cable.

Connector	Port A	
Pin	Name	Function
1	IO1	Input / Output 1
2	IO2	Input / Output 2
3	IO3	Input / Output 3
4	IO4	Input / Output 4
5	IO5	Input / Output 5
6, 7	VCC_RET	VCC_Return
8, 9	3.3 VCC	3.3V
10	Analog IO	Analog Input / Output
11, 12	AVCC_RET	AVCC_Return

Connector Pin Position



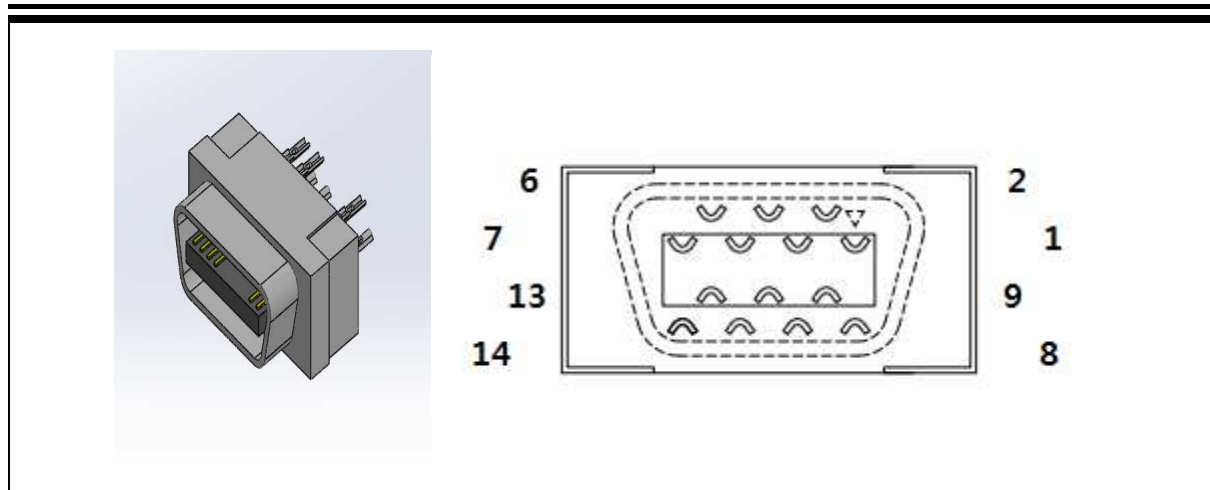
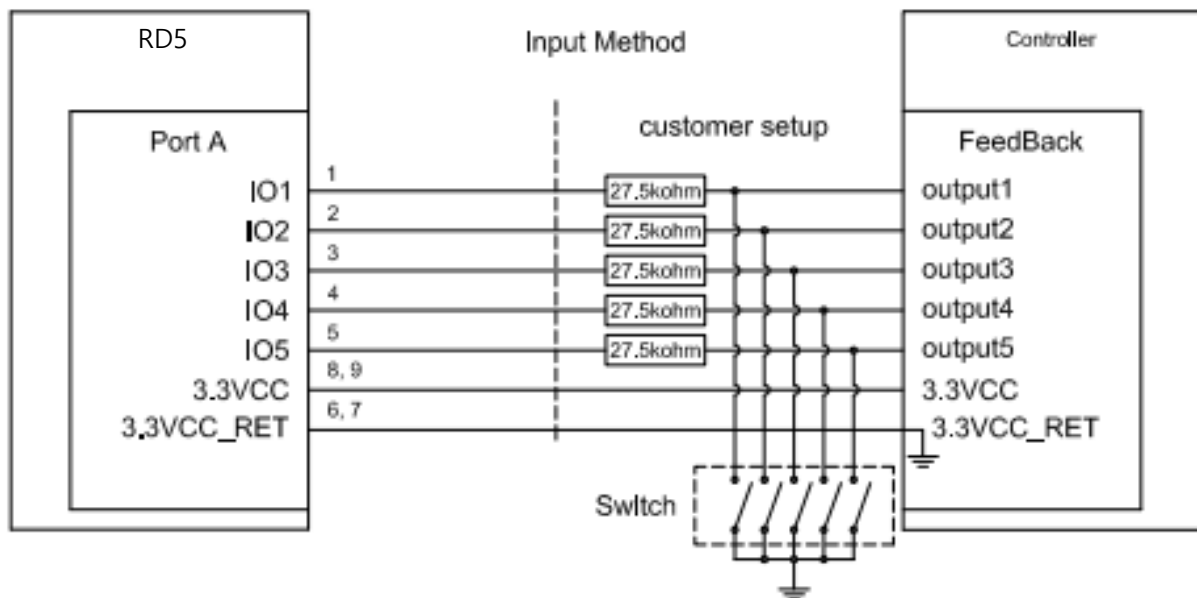


Figure 3.6-1 describes wiring diagram for IO connection. (Input, pull-down).



<Figure 3.6-1>

*VDDIO = Min 3.14V ~ Max 3.47V(normal 3.3V)

*VSS = 0V(supply ground)

*High-level input voltage = $2.0V \leq V \leq VDDIO + 0.3V$

*low-level Input voltage = $VSS - 0.3V \leq V \leq 0.8V$

*Input current = 150uA (pull-up)

*input current = 120uA (pull-down)

3.7 Port B

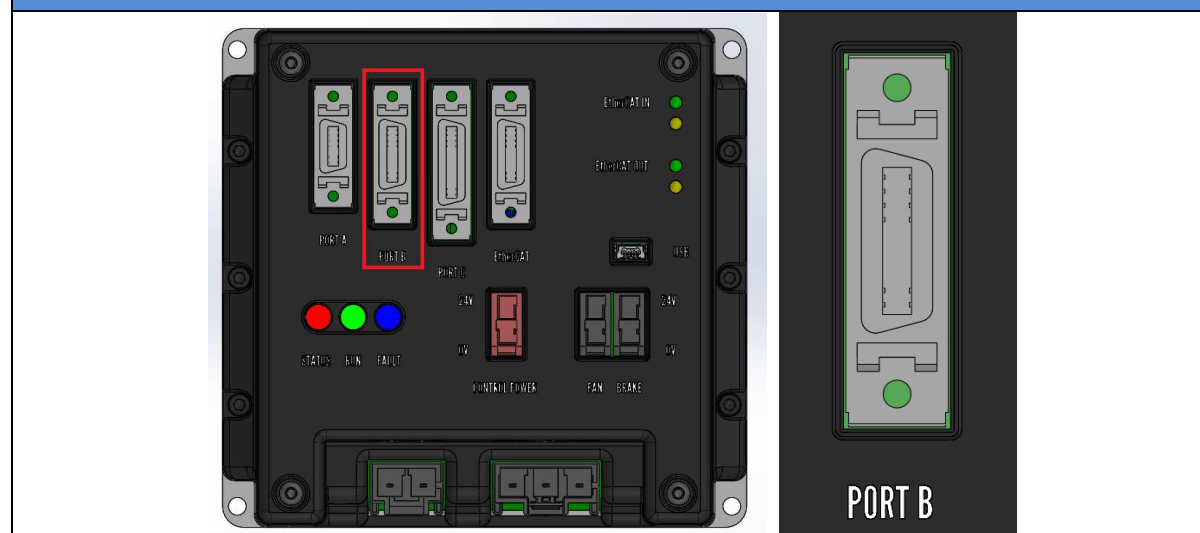
-Mate With 10120-3000PE (3M).

-Port B supports Absolute and incremental encoder communications.

-Use a 26 AWG twisted pair shielded cable.

Connector	Port B			
Type	Absolute		Incremental	
Pin	Name	Function	Name	Function
1, 11	5 VCC	DC 5V Positive Power output	5 VCC	DC 5V Positive Power output
2	Ch1_Clock-	Abs encoder Clock-	Index-	Incremental encoder Index-
3	Ch1_Data-	Abs encoder Data-	Channel A-	Incremental encoder Channel A-
4	Ch1_Clock+	Abs encoder Clock+	Index+	Incremental encoder Index+
5	Ch1_Data+	Abs encoder Data+	Channel A+	Incremental encoder Channel A+
6, 7, 16, 17	VCC_RET	DC Power Return	VCC_RET	DC Power Return
12	Ch2_Clock-	Abs encoder Clock-	NC	NC
13	Ch2_Data-	Abs encoder Data-	Channel B-	Incremental encoder Channel B-
14	Ch2_Clock+	Abs encoder Clock+	NC	NC
15	Ch2_Data+	Abs encoder Data+	Channel B+	Incremental encoder Channel B+

Connector Pin Position



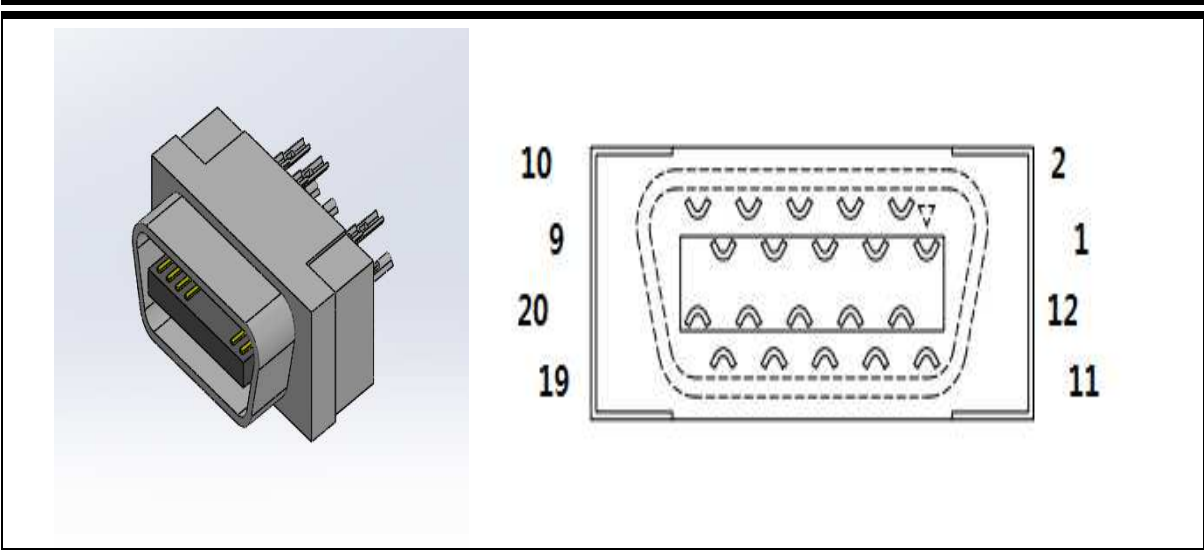
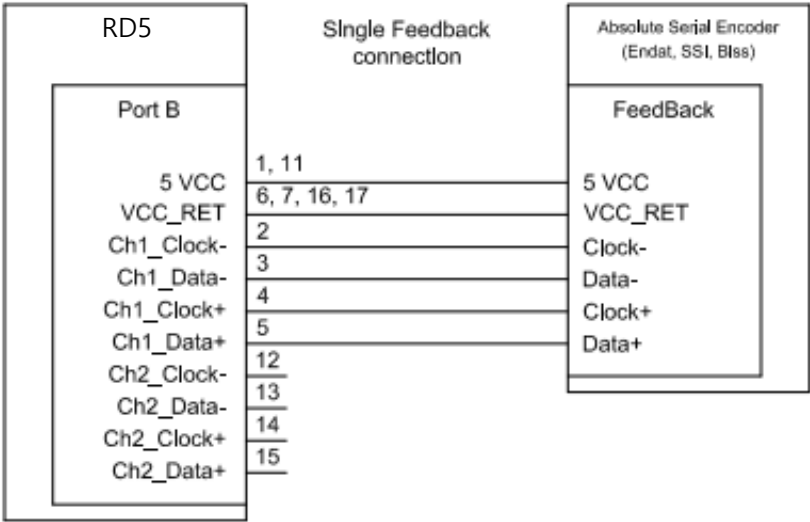
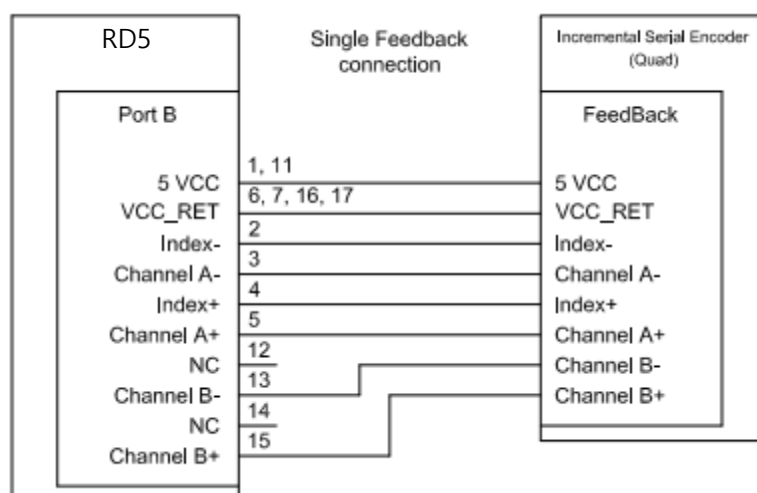


Figure 3.7-1 describes the wiring diagram for the Single Feedback connections (Absolute).



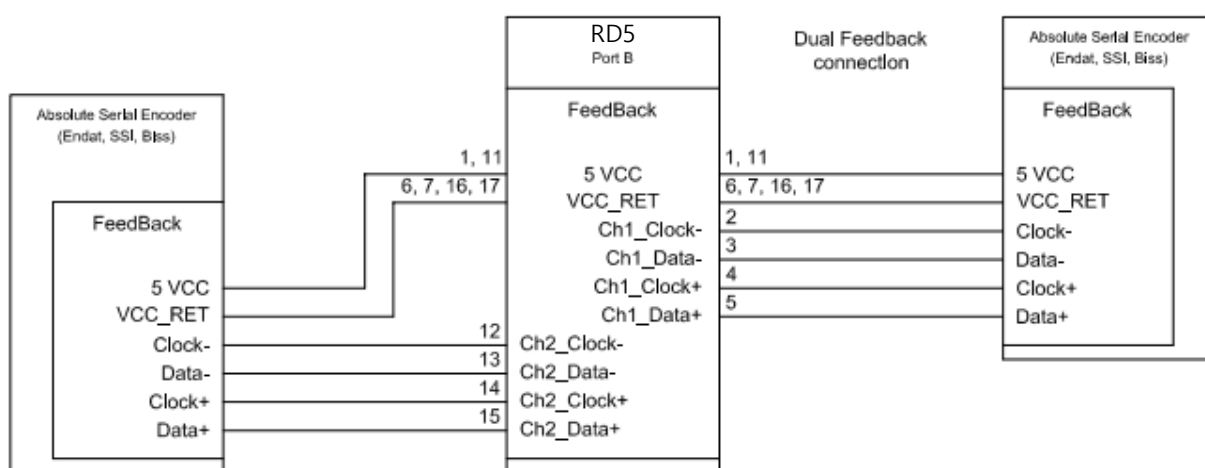
<Figure 3.7-1>

Figure 3.7-2 describes the wiring diagram for the Single Feedback connections (Incremental).



<Figure 3.7-2>

Figure 3.7-3 describes the wiring diagram for the Dual Feedback connections.



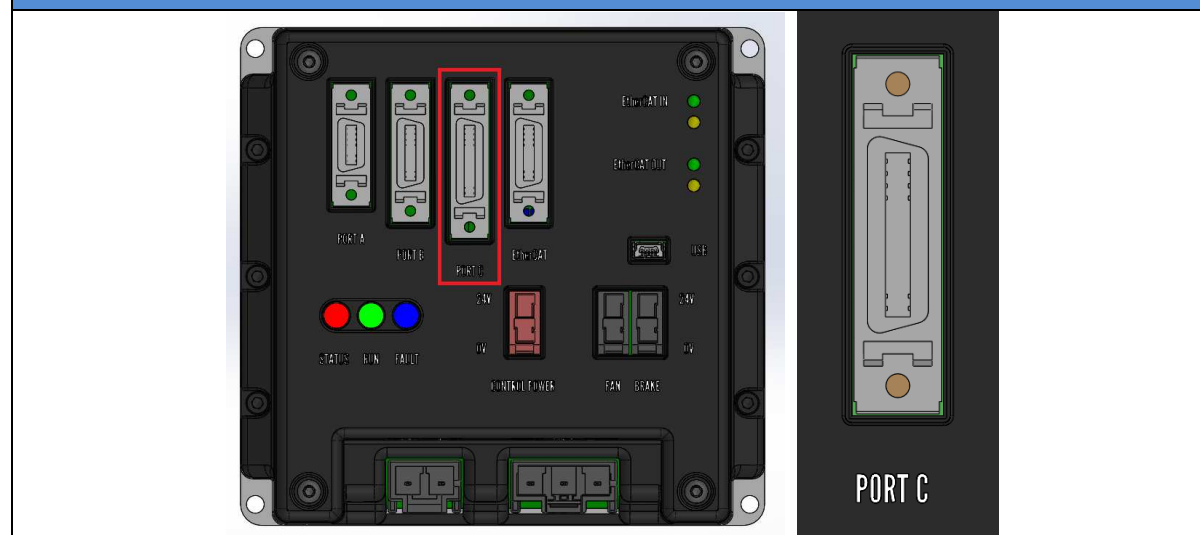
<Figure 3.7-3>

3.8 Port C

- Mate With 10126-3000PE (3M).
- The Hall Sensor is available with pins 1, 2 and 3.
- Use a 26 AWG twisted pair shielded cable.

Connector	Port C	
Pin	Name	Function
1	Hall A	Hall Sensor A Signal
2	Hall B	Hall Sensor B Signal
3	Hall C	Hall Sensor C Signal
5, 7, 9	AVCC_RET	AVCC Return
11, 13	5 VCC	5VCC Output
15	5 AVCC	5AVCC Output
16, 17	VCC_RET	VCC Return
21	DAC A	Digital to Analog converter
22	DAC B	Digital to Analog converter
23	DAC C	Digital to Analog converter

Connector Pin Position



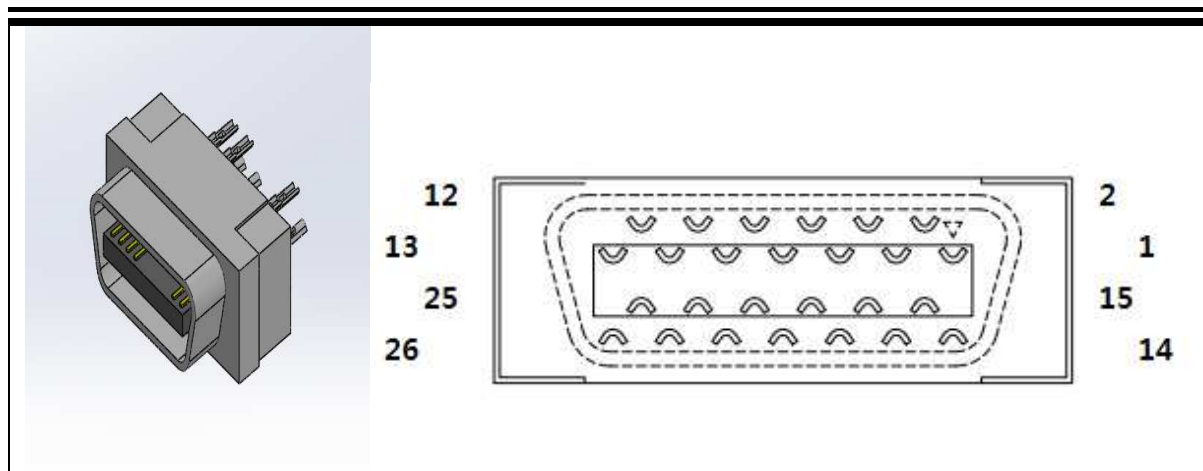
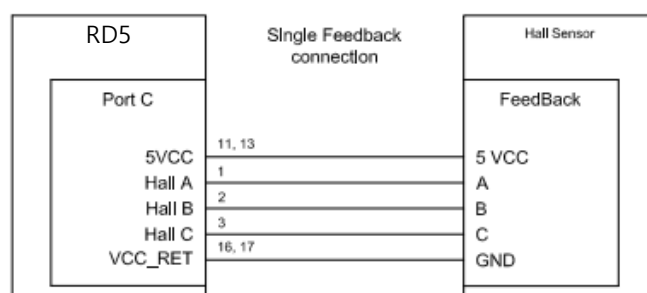
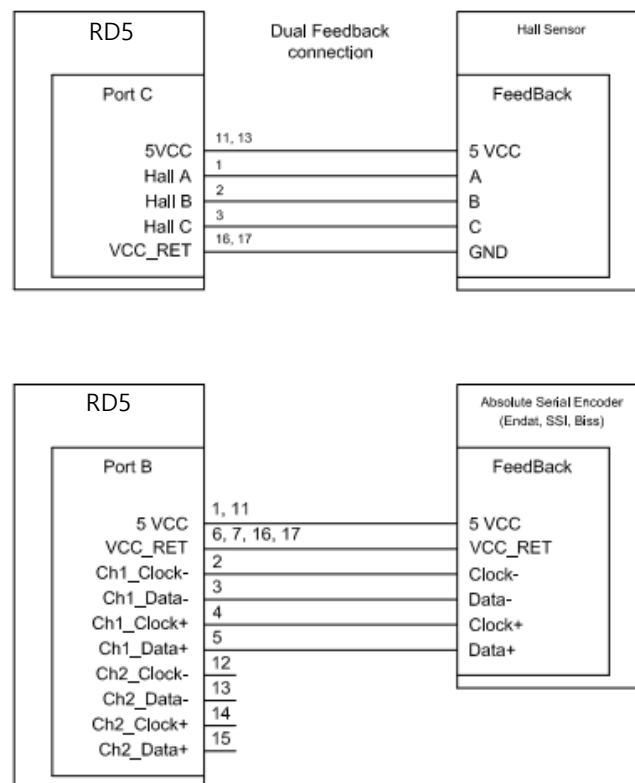


Figure 3.8-1 describes the wiring diagram for the Single Feedback connections.



<Figure 3.8-1>

Follow Figure 3.8-2 to use the hall sensor and absolute encoder together.



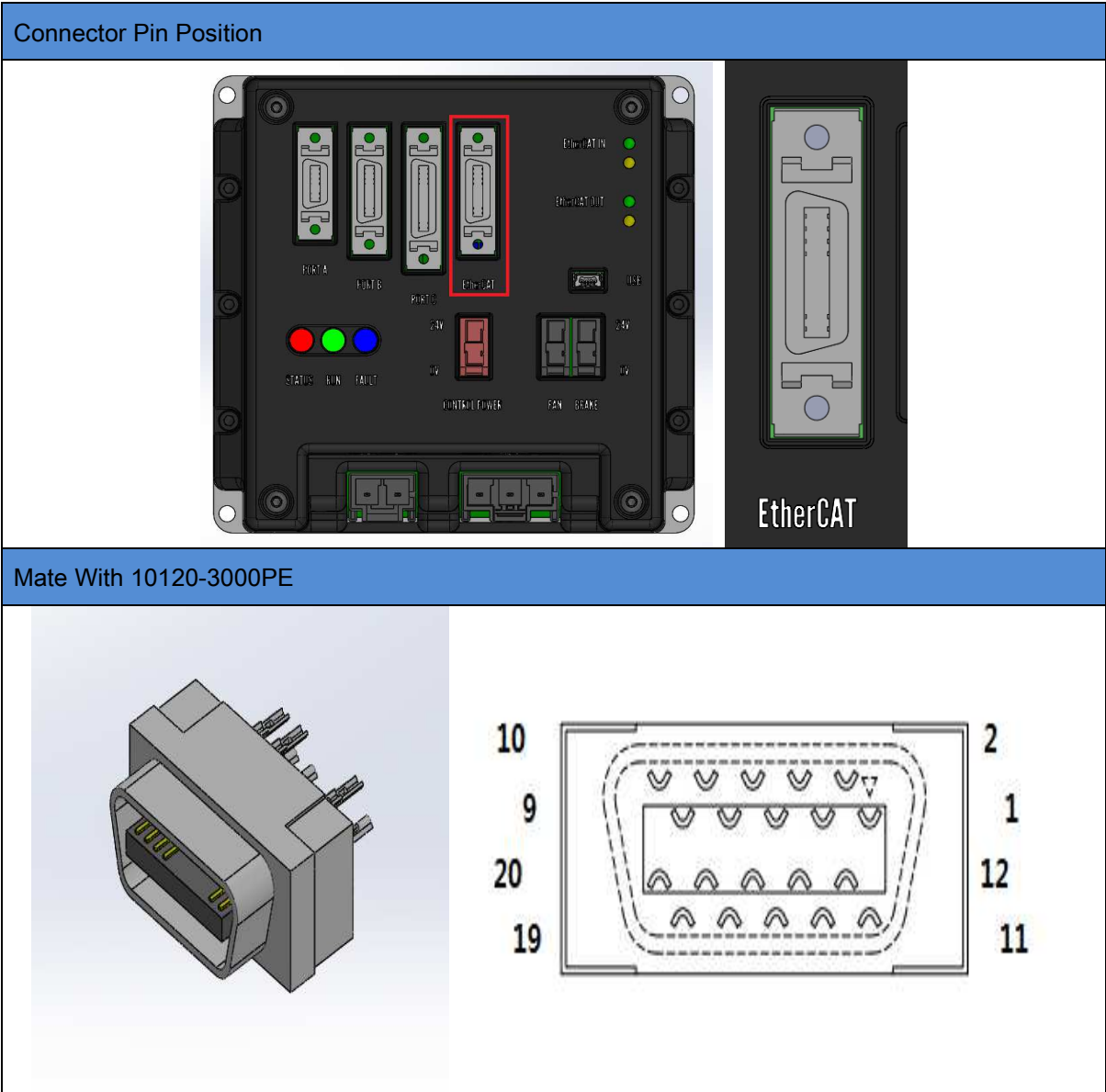
<Figure 3.8-2>

3.9 EtherCAT Communications

3.9.1 EtherCAT Pinouts

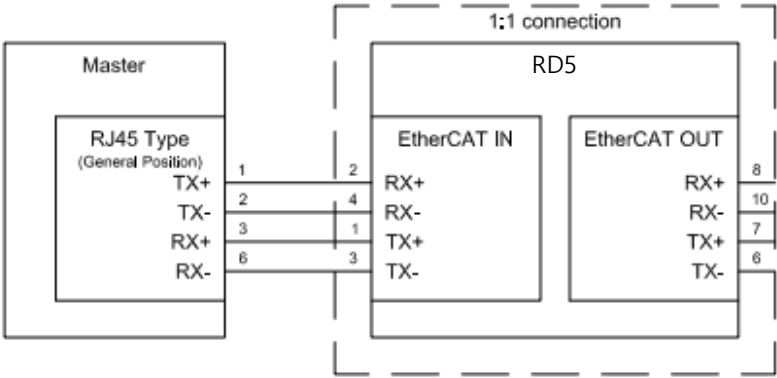
- Mate With 10120-3000PE (3M).
- EtherCAT communication supprt.
- Use a CAT5E SFTP cable.

Connector	EtherCAT	
Pin	Name	Fuction
1	ECAT_IN_TX+	EtherCAT in transmit+
2	ECAT_IN_RX+	EtherCAT in receive+
3	ECAT_IN_TX-	EtherCAT in transmit-
4	ECAT_IN_RX-	EtherCAT in receive-
5	N.C.	No Connected
6	N.C.	No Connected
7	ECAT_OUT_TX+	EtherCAT out transmit+
8	ECAT_OUT_RX+	EtherCAT out receive+
9	ECAT_OUT_TX-	EtherCAT out transmit-
10	ECAT_OUT_RX-	EtherCAT out receive-
11	ECAT_IN_TX_NP	EtherCAT in transmit neutral point
12	ECAT_IN_RX_NP	EtherCAT in receive neutral point
13	ECAT_IN_TX_NP	EtherCAT in transmit neutral point
14	ECAT_IN_RX_NP	EtherCAT in receive neutral point
15	N.C.	No Connected
16	N.C.	No Connected
17	ECAT_OUT_TX_NP	EtherCAT out transmit neutral point
18	ECAT_OUT_RX_NP	EtherCAT out receive neutral point
19	ECAT_OUT_TX_NP	EtherCAT out transmit neutral point
20	ECAT_OUT_RX_NP	EtherCAT out receive neutral point



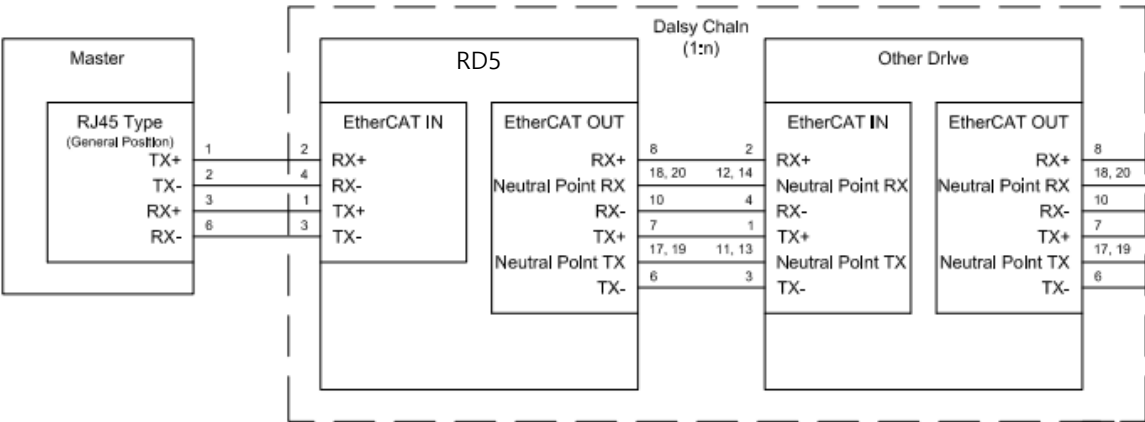
3.9.2 EtherCAT Wiring

Figure 3.9.2-1 describes the 1:1 wiring diagram for the EtherCAT connections.



<Figure 3.7.2-1>

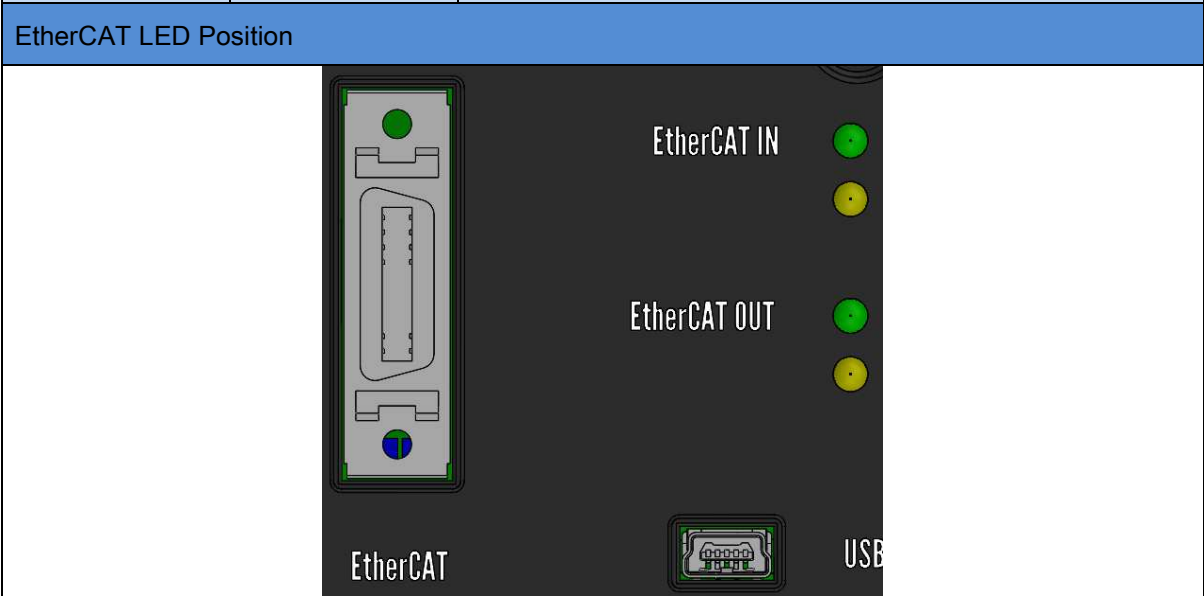
Figure 3.9.2-2 describes the 1:n wiring diagram for the EtherCAT connections.



<Figure 3.9.2-2>

3.9.3 EtherCAT Status Indicator LEDs

Sector	LED Color	Function
EtherCAT IN	Yellow	EtherCAT IN Active LED
EtherCAT IN	Green	EtherCAT IN Link LED
EtherCAT OUT	Yellow	EtherCAT OUT Active LED
EtherCAT OUT	Green	EtherCAT OUT Link LED



3.10 USB 2.0

- Connect a mini USB cable.
- D+ and D- are a twisted pair in the cable.
- The maximum cable length is 5m.
- Turn on the red LED in D3(Part number) when connecting USB.

Connector	USB	
Pin	Name	Function
1	V_BUS	USB VBUS 5V
2	D+	USB_P line
3	D-	USB_N line
4	N.C.	No Connected
5	USB_RET	USB VBUS Return



4. Catalog Number and Configuration

