FC-35B Unipolar Voltage or Current to Bipolar Voltage Signal Conditioner

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UL file E157382

Overview

The FC-35B is a 35mm DIN-rail or side-mount, selectable unipolar input to bipolar output signal conditioner with isolation between input and output, and isolation between 24-volt power and input/output. The FC-35B field configurable isolated signal conditioner is useful in eliminating ground loops and interfacing sensors to PLC analog input modules. It translates unipolar voltage inputs or current inputs to bipolar voltage outputs. The input and output signal levels are selected via DIP switches. In addition, the outputs can be either a direct conversion of the inputs or a reverse acting operation.

The user also has the option of customizing the input OFFSET (zero) and SPAN (full scale) adjustments that can be set to a percentage of the full scale via a pushbutton on the front panel.

Click on the above thumbnail or go to https://www.automationdirect.com/VID-PS-0003 for a short introductory video for the FC Series Signal Conditioners.

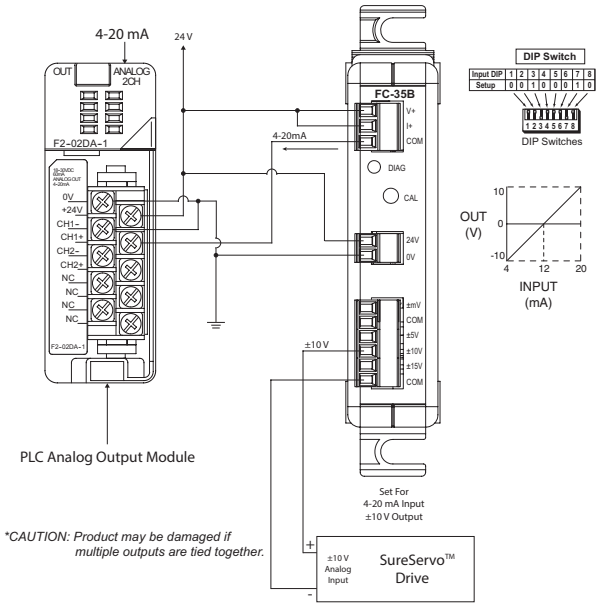
Specifications	
Input Specifications	
Input Ranges	0-5V, 0-10 V, 0-20 mA, 4-20 mA (DIP Switch Selectable/Invertable)
Input Impedance	410kΩ voltage input, 250Ω current input
Protection Type, Component	Polarity Protection Diode
External DC Power Required	24VDC ±10%, 40mA, Class 2
User Calibration Range	OFFSET (zero): 0-20% (e.g. 0-1.0V / 5V mode) SPAN (full-scale): 80-102% (e.g. 4.0 - 5.1V / 5V mode)
Output Specifications	
Output Ranges	±50 mV, ±100 mV, ±5V, ±10 V, ±15 V
Load Impedance	2.5kΩ minimum on ±50mV and ±100mV Range 2kΩ minimum on ±5V, ±10V and ±15V Range
Sample Duration Time	10 ms
Maximum Inaccuracy	0.1% FSO @ 25°C (1.0% 50 mV / 100 mV)
Accuracy vs. Temperature	±60 PPM of Full Scale / °C Maximum
Output Current	±50 mV/±100 mV @ 2.5mA max, ±5V, ±10 V, ±15 V @ 7.5mA max
Terminal Block Specifications	
Field Wiring	Removable Screw Type Terminal Blocks (Included)
Number of Positions	2 (Dinkle: EC350V-02P), 3 (Dinkle: EC350V-03P), 6 (Dinkle: EC350V-06P)
Wire Range	28-14 AWG solid or stranded conductor; wire strip length 1/4" (6-7mm)
Screw Torque	1.7 inch-pounds (0.19 Nm)
General Specifications	
Surrounding Air Temperature	0 to 60°C (32 to 140°F) IEC 60068-2-14 (Test Nb, Thermal Shock)
Storage Temperature	-20 to 70°C (-4 to 158°F) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
Enclosure Rating	IP20
Humidity	5 to 95% (non-condensing) IEC 60068-2-30 (Test Db, Damp Heat)
Environmental Air	No corrosive gases permitted (EN61131-2 pollution degree 1)
Vibration	MIL STD 810C 514.2 IEC 60068-2-6 (Test Fc)
Shock	MIL STD 810C 516.2 IEC 60068-2-27 (Test Ea)
Insulation Resistance	>10M @ 500VDC
Noise Immunity	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000 V @ 1µS pulse IEC 61000-4-4 (FTB) RFI, (145 MHz, 440 MHz 5W @ 15 cm) IEC 61000-4-3 (RFI)
Weight	0.3lbs
Isolation	1000VDC Power to Input 1800VDC Power to Output 1800VDC Input to Output applied for 1 second (100% tested)
Agency Approvals	UL508*, File Number: E157382, CE

*** In order to comply with UL508, the supplied power must be less than 26VDC and fused at a maximum of 3 amps.**

FC-35B Applications and Dimensions

Application Example 1

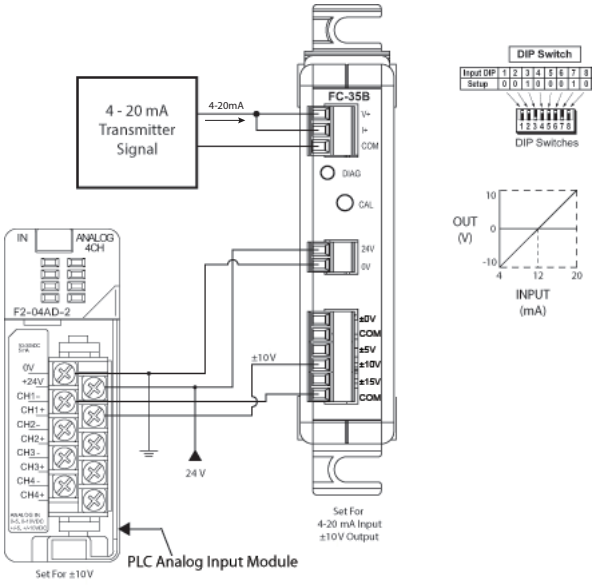
Use the FC-35B to convert a unipolar output from a PLC analog card to a bipolar ±10VDC signal to control a SureServo's External Velocity Command.



*CAUTION: Product may be damaged if multiple outputs are tied together.

Application Example 2

Use the FC-35B to convert and isolate a unipolar output from a 4-20 mA sensor or transmitter to a bipolar ±10VDC signal for a PLC input.



*CAUTION: Product may be damaged if multiple outputs are tied together

Wiring Connections

Input Terminal Block	
Faceplate Label	***Description***
V+	Voltage In
I+	Current In
COM	Common

NOTE: V+ and I+ must be jumpered for Current input

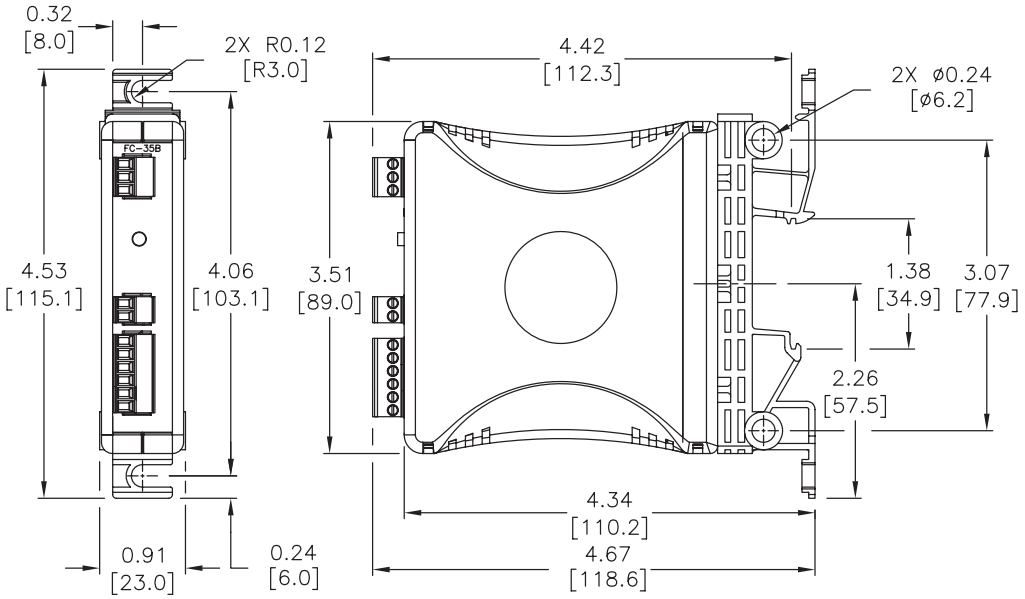
Output Terminal Block	
Faceplate Label	***Description***
±mV	±50 mV or ±100 mV Output
COM	COM Connection (used with mV signals)
±5V	±5V Output
±10 V	±10V Output
±15 V	±15V Output
COM	COM Connection (used with non-mV signals)

External Power Terminal Block	
Faceplate Label	***Description***
24 V	24 VDC ±10% (Class 2)
0V	0V

Switch/LED Labels	
Faceplate Label	***Description***
DIAG	Diagnostic LED flashing indication
CAL	Push button switch input to initiate calibration, etc.

Dimensions

inches [mm]



FC-B34 Bipolar Voltage to Unipolar Voltage or Current Signal Conditioner

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UL file E157382

Overview

The FC-B34 is a 35mm DIN-rail or side-mount, selectable bipolar input to unipolar output signal conditioner with isolation between input and output, and isolation between 24 volt power and input/output. The FC-B34 field configurable isolated signal conditioner is useful in eliminating ground loops and interfacing sensors to PLC analog input modules. It translates bipolar voltage input to unipolar voltage output or bipolar voltage input to a current output. The input and output signal levels are selected via DIP switches. In addition, the outputs can be either a direct conversion of the inputs or a reverse acting operation. The user also has the option of customizing the input OFFSET (zero) and SPAN (full scale) adjustments that can be set to a percentage of the full scale via a pushbutton on the front panel.

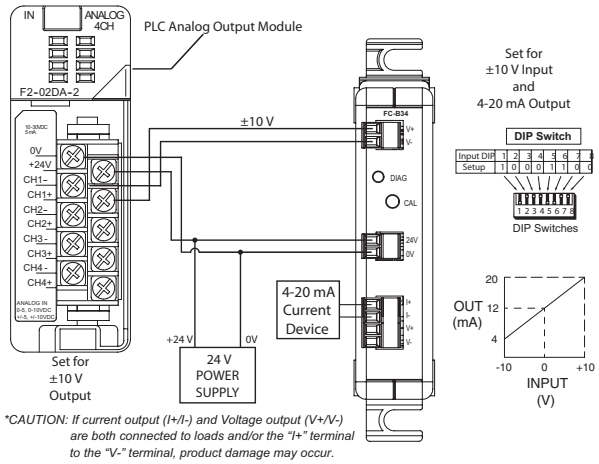
Click on the above thumbnail or go to https://www.automationdirect.com/VID-PS-0003 for a short introductory video for the FC Series Signal Conditioners.

Specifications	
Input Specifications	
Input Ranges	±15V, ±10V, ±5V, ±100mV, ± 50mV (DIP Switch Selectable)
Input Impedance	15V = 9.8kΩ, 10V = 11.56kΩ, 5V = 20.3kΩ, 100mV = 2.69kΩ, 50mV = 1.27kΩ, -50mV = 1.19kΩ, -100mV = 2.29kΩ, -5V = 8.07kΩ, -10V = 7.76kΩ, -15V = 7.64kΩ
Protection Type, Component	Polarity Protection Diode
External DC Power Required	24VDC ±10%, 50mA, Class 2
User Calibration Range	OFFSET (zero): 0-20% (e.g. -4V / ±5V mode) SPAN (full-scale): 80-102% (e.g. 4.0 - 5.1V / ±5V mode)
Output Specifications	
Output Ranges	0-5V, 0-10 V, 0-20 mA, 4-20 mA (DIP Switch Selectable)
Load Impedance	2kΩ Minimum, Voltage Output 550Ω Maximum, Current Output
Sample Duration Time	10ms
Maximum Inaccuracy	0.1% FSO (±15V, ±10V, ±5V Inputs), 1.5% FSO (±100mV, ±50mV Inputs) @ 25°C
Accuracy vs. Temperature	+/-60 PPM of Full Scale/ °C Maximum
Output Current	21mA max for mA-Out mode/ 10mA max for Volt-out mode
Terminal Block Specifications	
Field Wiring	Removable Screw Type Terminal Blocks, (included)
Number of Positions	2 (Dinkle: EC350V-02P), 2 (Dinkle: EC350V-02P), 4 (Dinkle: EC350V-04P)
Wire Range	28-14 AWG solid or stranded conductor; wire strip length 1/4" (6-7mm)
Screw Torque	1.7 inch-pounds (0.19 Nm)
General Specifications	
Surrounding Air Temperature	0 to 60°C (32 to 140°F) IEC 60068-2-14 (Test Nb, Thermal Shock)
Storage Temperature	-20 to 70°C (-4 to 158°F) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
Enclosure Rating	IP20
Humidity	5 to 95% (non-condensing) IEC 60068-2-30 (Test Db, Damp Heat)
Environmental Air	No corrosive gases permitted (EN61131-2 pollution degree 1)
Vibration	MIL STD 810C 514.2 IEC 60068-2-6 (Test Fc)
Shock	MIL STD 810C 516.2 IEC 60068-2-27 (Test Ea)
Insulation Resistance	>10MΩ @ 500VDC
Noise Immunity	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000V @ 1µS pulse IEC 61000-4-4 (FTB) RFI, (145 MHz, 440 MHz 5W @ 15 cm) IEC 61000-4-3 (RFI)
Weight	0.3lbs
Isolation	1800VDC Power to Input 1800VDC Power to Output 1800VDC Input to Output applied for 1 second (100% tested)
Agency Approvals	UL508*, File Number: E157382, CE
*** In order to comply with UL508, the supplied power must be less than 26VDC and fused at a maximum of 3 amps.**	

FC-B34 Applications and Dimensions

Application Example 1

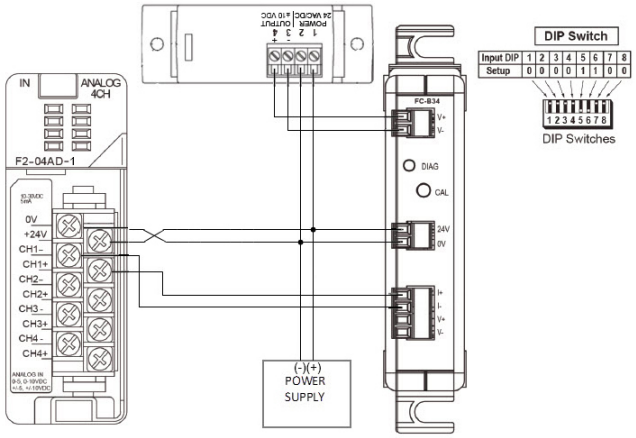
The FC-B34 can be used to convert a bipolar ±10VDC signal to a 4-20 mA signal.



*CAUTION: If current output (I+/I-) and Voltage output (V+/V-) are both connected to loads and/or the "I+" terminal to the "V-" terminal, product damage may occur.

Application Example 2

The FC-B34 can be used to convert the bipolar ±10VDC from a DCT100-10B-24S current transducer to a 4-20 mA or 0-10 VDC that can be used by a PLC.



Wiring Connections

Input Terminal Block	
Faceplate Label	***Description***
V+	Signal In +
V-	Signal In -

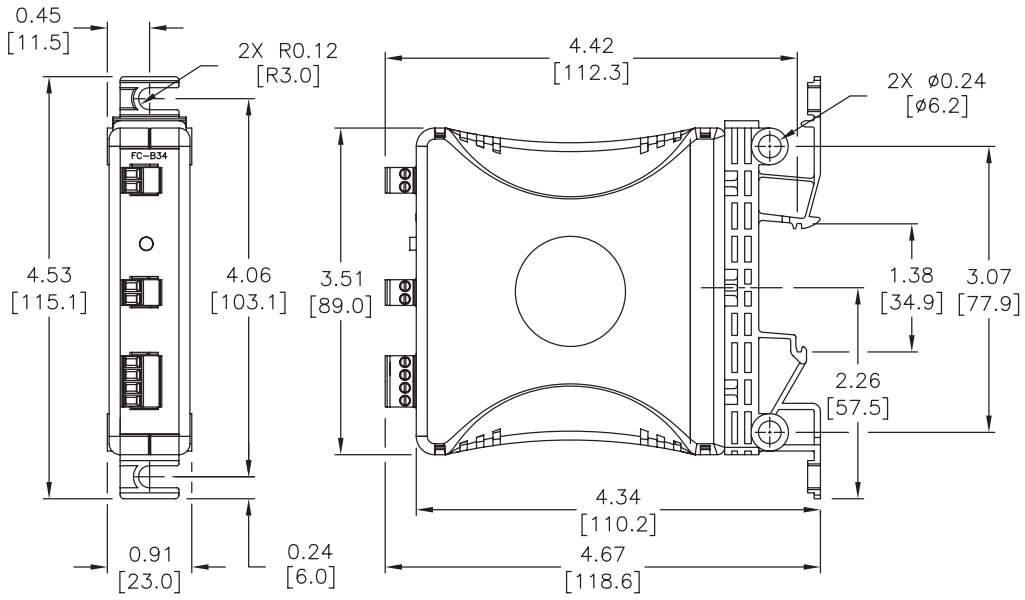
Output Terminal Block	
Faceplate Label	***Description***
I+	Current
I-	Current
V+	Voltage
V-	Voltage

External Power Terminal Block	
Faceplate Label	***Description***
24 V	24VDC ±10% (Class 2)
0V	0V

Switch/LED Labels	
Faceplate Label	***Description***
DIAG	Diagnostic LED flashing indication
CAL	Pushbutton switch input to initiate calibration, etc.

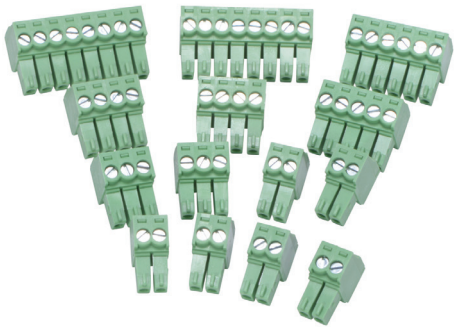
Dimensions

inches [mm]



FC Series Accessories

FC-5MM



FC-35MM

Description

Universal terminal block replacements for the FC Series signal conditioners. Each packcage includes enough terminal blocks to replace all the terminal blocks on any FC Series signal conditioner according to the following table:

FC Series Terminal Blocks		
FC Series Model	***Terminal Block Replacement Part Number***	***Package Includes***
FC-11	FC-5MM	(2) 2-pole blocks (2) 3-pole blocks (1) 4-pole blocks
FC-33		
FC-R1		
FC-T1		
FC-ISO-C	FC-35MM	(6) 2-pole blocks (2) 3-pole blocks (2) 4-pole blocks (1) 5-pole blocks (1) 6-pole blocks (2) 8-pole blocks
FC-ISO-D		
FC-B34		
FC-35B		
FC-P3		
FC-3RLY2		
FC-3RLY4		

Note: Depending on the model, some terminal blocks in the package may be unused.

Universal Signal Conditioners				
Part No.	***Description***	***Rated Torque (N·m)***	***Weight (Lbs)***	***Price***
FC-5MM	Terminal block, replacement, 5mm. Package of 5. For use with FC Series signal conditioners.	0.5	0.1	$10hd:
FC-35MM	Terminal block, replacement, 3.5mm. Package of 14. For use with FC Series signal conditioners.	0.2	0.1	$10hc: