



I/O Interface Modules Catalog

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Square D offers a complete range of small, cost effective interface modules that allow the I/O signals from automation devices to be customized on a single point basis. The low profile analog and discrete interface modules offer:

Adaptation

of voltage levels between programmable controllers, measurement devices, etc., to field devices such as sensors and actuators

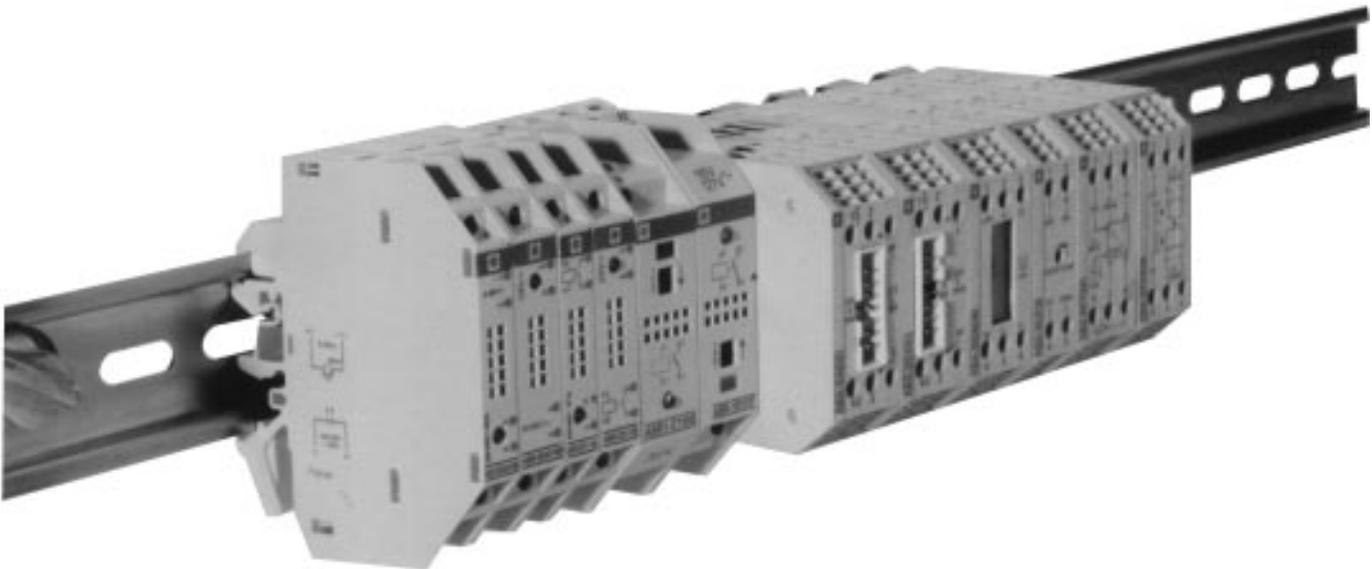
Amplification

of signals for control of loads requiring high power levels

Conversion

of solid-state logic, analog-to-digital and digital-to-analog signals

Isolation



HOW TO ORDER

Applies to all products listed in this catalog except for some of the accessory products listed on page 48.

Applies to some of the accessory products listed on page 48.

<u>To Order Specify:</u>	<u>Catalog Number</u>
• Type Number	Type ABA-6AD121

<u>To Order Specify:</u>	<u>Catalog Number</u>	
• Class Number • Type Number	Class 9080	Type MH334



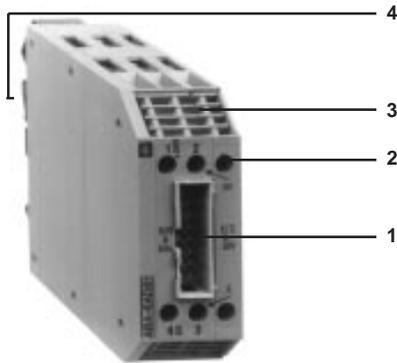
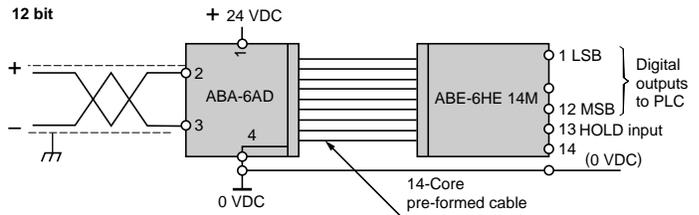
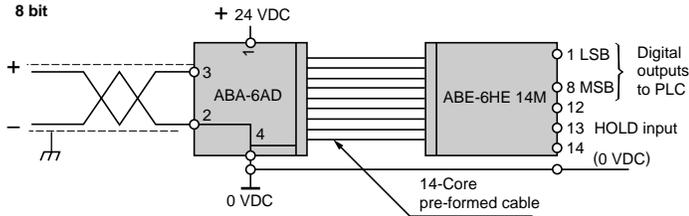
Family	Sample Cat. No.	Description
 <p>Pages 2-5</p>	ABA-6AD	The analog to digital conversion modules are designed to allow for flexibility in applications where only one or two analog input signals exist. These modules can be used in small PLC systems when a dedicated analog card is not available or in large systems where the dedicated analog card is not cost effective because it offers more channels than necessary. All modules are DIN rail mountable and meet UL, CSA (pending) and IEC ratings.
 <p>Pages 6-9</p>	ABA-6DA	The digital to analog conversion modules are designed to allow for flexibility in applications where only one or two analog output signals exist. These modules can be used in small PLC systems when a dedicated analog card is not available or in large systems where the dedicated analog card is not cost effective because it offers more channels than necessary. All modules are DIN rail mountable and meet UL, CSA (pending) and IEC ratings.
 <p>Pages 10-13</p>	ABA-6SA	Threshold detection modules are available to monitor the level of a standard analog signal (0-10 VDC, 0-20 mA) in relation to fixed preset thresholds. They provide 2 discrete signals representing the state of the signal in relation to these 2 thresholds. All modules are DIN rail mountable and meet UL, CSA (pending) and IEC ratings .
 <p>Pages 14-16</p>	ABA-6LP	A potentiometer reference supply interface module is available to generate a stable reference voltage (or current) from a 24 VDC voltage to supply a potentiometer. These modules are characterised by a high level of stability compared to the variations in the ambient temperature and fluctuations in the supply voltage. All modules are DIN rail mountable and meet UL, CSA (pending) and IEC ratings.
 <p>Pages 18-22</p>	ABA-6TA	Modules for voltage/current analog transmitters are available to provide conversion between two analog signal types. Available with isolation or without isolation, these interface modules provide flexibility in small PLC or large PLC installations where long cable runs are required or a miss-match between a field device signal and a logic device signal exist. All modules are DIN rail mountable and meet UL, CSA (pending) and IEC ratings.
 <p>Pages 24-30</p>	ABS-2E ABS-2S	The solid state relay interface modules are designed for use in systems that require high operating rates and/or silent operation. The discrete input/output modules are available to overcome the application considerations of multiple control voltages. These modules allow the designer to concentrate on the preferred field devices and can then install the interface modules to condition either input or output signals to the rated voltage of the PLC I/O points. All modules are DIN rail mountable and meet UL, CSA and IEC ratings.
 <p>Pages 32-46</p>	ABR-1E ABR-1S ABR-2E ABR-2S	The electromechanical relay modules are designed for use in systems that require various contact (N/O, N/C or C/O) configurations. The discrete input/output modules are available to overcome the application considerations of multiple control voltages. These modules allow the designer to concentrate on the preferred field devices and can then install the interface modules to condition either input or output signals to the rated voltages of the PLC I/O points. All modules are DIN rail mountable and meet UL, CSA and IEC ratings.
<p>Pages 47-49</p>	AM1-D 9080	Accessories (DIN track, marking labels, etc.) for use with the Interface Module family.

Analog / Digital Converters



The function of analog/digital converters is to transform a standard analog signal (0-10 V DC; 0-20 mA ; 4-20 mA) into a digital signal which is used by the discrete inputs of a processing unit (E.G., PLC).

The main use of analog/digital converters is in simple applications which only require a small number of analog inputs. They provide a low-cost solution to the acquisition of analog signals on a single point basis, thus saving money by avoiding the cost of an entire board.



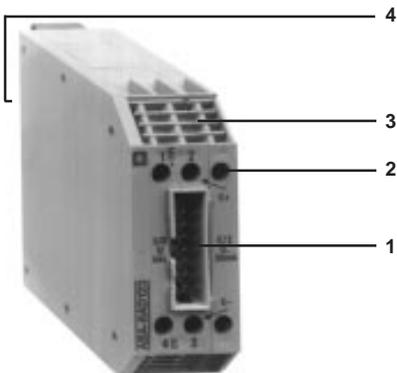
The ABA-6AD range is comprised of two types of products :

8 bit analog/digital converters

These interfaces have an 8 bit resolution (the signal is coded in binary on 8 discrete outputs). They are designed for applications which only require limited precision and resolution.

The analog input is referenced to the 0 VDC of the module supply.

Input range: 0-10 VDC; 0-20 mA; 4-20 mA



12 bit analog/digital converters

These interfaces have a 12 bit resolution (the signal is coded in binary on 12 discrete outputs). They are designed for applications which require a high level of precision and high resolution.

The analog input is differential, which provides improved immunity to interference.

Input range : 0-10 VDC
0-20 mA

- 1 The ABF - H14H020 (.2 M Ribbon cable with female connectors) can be used to connect the interface module to the terminal block connector (ABE - 6HE14M).
- 2 The screw clamp terminals provide secure termination of one or two (stranded or solid) wires. The terminals are shipped backed out so that each terminal is ready to accept wires right out of the box, saving on installation time. Combination head screws are used to ease installation. All terminals are clearly marked to ease wiring.
- 3 Location for 5 characters (number and/or letter) terminal identification. See page 49 for complete listing of available markers.
- 4 Mounts on the common 35mm DIN 3 track or the DIN 1 track. See pages 47-48 for complete listing of available track.





ABA-6AD81



ABA-6AD123



ABE-6HE14M



ABF-H14H020



ABC-6HE14F



ABF-C14N050

Analog signal input (from field device)	Digital output (to PLC)	Catalog No.	Standard Pack	Weight lb/kg
0-10 V	8 bit	ABA-6AD81	1	.14/0.065
	12 bit	ABA-6AD121	1	.140/0.065
0-20 mA	8 bit	ABA-6AD83	1	.14/0.065
	12 bit	ABA-6AD123	1	.140/0.065
4-20 mA	8 bit	ABA-6AD82	1	.14/0.065

Cabling Accessories

Description	Catalog No.	Standard Pack	Weight (lb/kg)
Terminal block connector - 14 pole	ABE-6HE14M	1	0.17/0.075
.2 M Ribbon cable with female connectors	ABF - H14H020	1	0.02/0.008
Female connectors	ABC-6HE14F	2	0.01/0.005
5 M Ribbon cable	ABF-C14N050	1	1.15/0.520



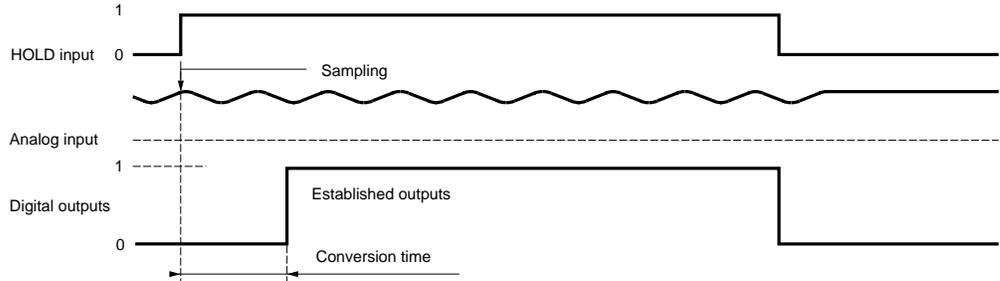


Operation

ABA-6AD modules convert analog to digital signals on command from the processing unit in the form of a "Hold" sampling signal, as shown in the diagram below.

This mode of operation enables the discrete outputs on several modules to be connected in parallel to the same discrete inputs on the processing unit, and thus a simple multiplexing of several analog inputs.

Operating Diagram



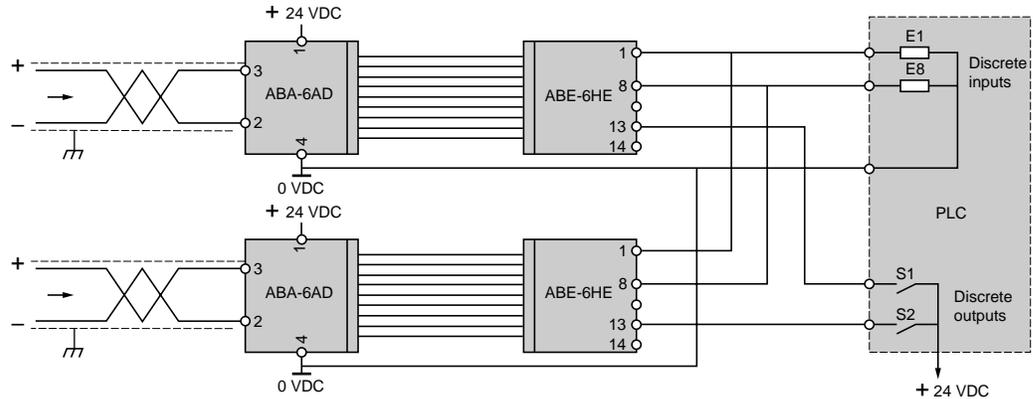
The principles of analog measurement must be observed, in particular :

- shielded twisted pair cable should be used, minimum cross-section 24AWG/0.22 mm²
- only circuits with the same earth reference should be connected in the same multipair cable
- measurement cables should be kept separate from discrete I/O cables (especially those of relay outputs) and power cables
- parallel routing should be avoided (there should be at least 7.8in./20 cm between cables) and intersections should be made at right angles

Cabling digital I/O

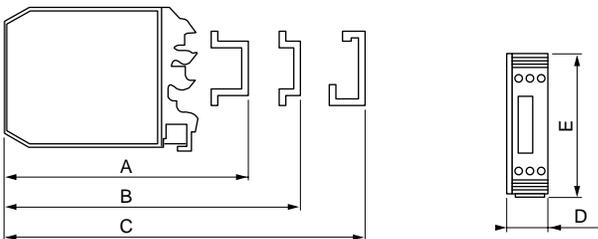
They are connected using a ribbon cable fitted with 2 14-pin female connectors. Terminal block connector ABE-6HE14M is used to connect the cable to the device screw terminals.

Multiplexing several analog inputs (diagram with 2 analog inputs)



Dimensions

ABA-6AD



	Inches	mm
A	3.86	98.0
B	3.56	90.5
C	3.74	95.0
D	0.89	22.5
E	2.39	60.6





Approvals	UL File E 39281, CSA pending and IEC		
Conforming to standards	IEC 947-1; VDE 0110b. UL 508		
Degree of protection	Conforming to IEC-529 (protection against direct contact)		IP 20B
Protective treatment	Tropical Climate		
Flame resistance	Conforming to IEC 696-2-1	Incandescent wire Semi-sinusoidal waves	1562°F/850°C
Shock resistance	Conforming to IEC 68-2-27	11 ms	50 g
Vibration resistance	Conforming to IEC 68-2-6	10-55 Hz	5 g
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 2	kV 4
Radio Frequency Immunity	Conforming to IEC 801-3	Level 3	V/m 10
Resistance to rapid transients	Conforming to IEC 801-4 Level 3	On supply	kV 2
		On I/O	kV 1
Resistance to shock waves	Conforming to IEC 255-4	Waveform 1.2/50 µs; 0.5 J	kV 0.5
Cross-sections which can be connected	Flexible cable, no cable end	1 wire	20 to 14 AWG / 0.5 to 2.5 mm ²
	Flexible cable with cable end	1 wire	24 TO 14 AWG / 0.22 to 2.5 mm ²
		2-wire	24 TO 18 AWG / 0.2 to 1.5 mm ²
Solid cable	1 wire	20 TO 14 AWG / 0.5 to 2.5 mm ²	
Operating position	Any		
Ambient air temperature around the device	Operation	Mounted vertically, touching	32 to 104°F/0 to 40°C
		Devices 2 cm apart	32 to 122°F/0 to 50°C
Storage	-40 to 185°F/-40 to 85°C		
Insulation voltage	Terminals/fixing rails		kV 2
Installation category	Conforming to IEC 947-1 II		
Degree of pollution	Conforming to IEC 947-1 2		
Mounting	Standard rails See pages 47-48		

Special Characteristics

			8 bits	12 bits	
Digital output			24 ± 20 %	24 ± 20 %	
	Supply	Supply voltage	VDC	Including ripple	
		Maximum voltage without damage	VDC	30	30
		Maximum current consumed	mA	50 + output current	17 + output current
Analog input	Voltage	Range	VDC	0-10	0-10
		Filtering		LC filter	LC filter
		Passband	Hz	20,000	400
		Maximum voltage in common mode	VDC	NA	15
		Maximum voltage in serial mode	VDC	60	60
		VDC input impedance	kOhm	≥ 200	≥ 200
		Built-in protection		Reversed polarity	Reversed polarity
	Current	Range	mA	0-20 ; 4-20	0-20
		Filtering		LC filter	LC filter
		Passband	Hz	20,000	400
		Maximum voltage in common mode	VDC	NA	15
		Maximum voltage in serial mode	VDC	3.5	3.5
		VDC input impedance	Ohm	50	50
		Built-in protection		Reversed polarity	Reversed polarity
“HOLD” input	Rated voltage	VDC	24	24	
	Maximum voltage	VDC	30	30	
	State 1 (ON) U ≥ ; I ≥		18 VDC; 2 mA	18 VDC; 2 mA	
	State 0 (OFF) U ≤ ; I ≤		12 VDC; 1.2 mA	12 VDC; 1.2 mA	
Discrete digital outputs	Number		8	12	
	Rated voltage	VDC	24	24	
	Maximum voltage (0 mA)	VDC	V DC – 1	V DC – 1	
	Maximum current per output	mA	25	25	
	Maximum voltage drop	VDC	4	4	
	Impedance	kOhm	125	125	
Conversion	Conversion time	µs	10	20	
	Non linearity		± 1LSB	± 1/2 LSB	
	Maximum error at 68°F/20°C		± 1LSB	± 1LSB	
	Temperature error coefficient	0-10 VDC input	ppm/°K	50	25
		0-20 mA input	ppm/°K	80	40
		4-20 mA input	ppm/°K	90	NA
	Resolution	0-10 VDC input	mV	39	2.441
		0-20 mA input	µA	78.1	4.883
		4-20 mA input	µA	65.5	NA

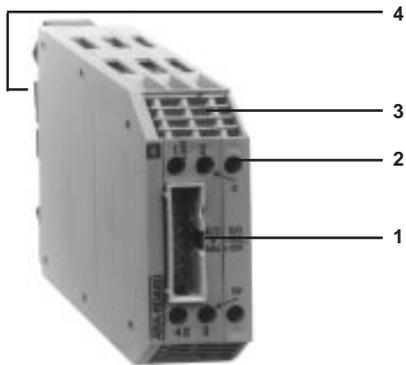
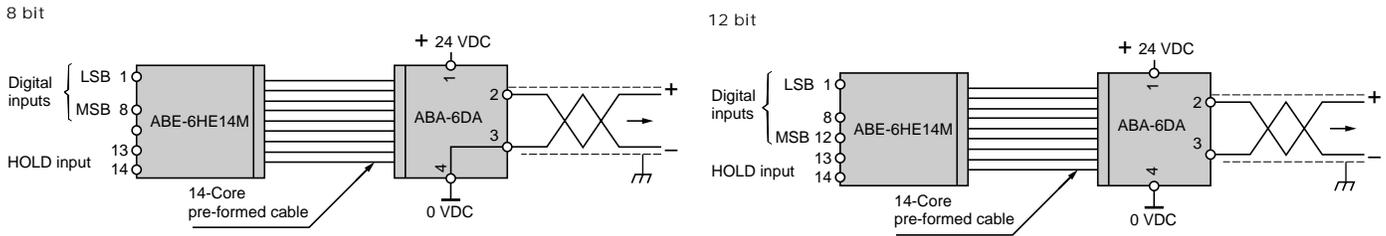


Digital/Analog Converters



The function of digital/analog converters is to generate a standard analog signal (0-10 VDC ; 0-20 mA) from a digital signal sent by a processing unit (PLC) which is connected to the digital inputs of the converter.

The main use of digital/analog converters is in applications which only require a small number of analog outputs. They provide a low-cost solution to the generation of analog signals on a single point basis, thus saving money by avoiding the cost of an entire board.



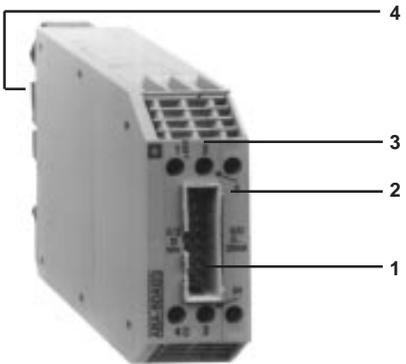
The ABA-6DA range is comprised of two types of products:

8 bit digital/analog converters

These interfaces have an 8 bit resolution (the signal is coded in binary on 8 discrete inputs). They are designed for applications which only require limited precision and resolution.

The analog output is referenced to the 0 VDC of the module supply.

Output range: 0-10 VDC ; ± 10 VDC ;
0-20 mA



12 bit digital/analog converters

These interfaces have a 12 bit resolution (the signal is coded in binary on 12 discrete inputs). They are designed for applications which require a high level of precision and high resolution.

Output range: 0-10 VDC ; ± 10 VDC ;
0-20 mA

- 1 The ABF - H14H020 (.2 M Ribbon cable with female connectors) can be used to connect the interface module to the terminal block connector (ABE - 6HE14M).
- 2 The screw clamp terminals provide secure termination of one or two (stranded or solid) wires. The terminals are shipped backed out so that each terminal is ready to accept wires right out of the box, saving on installation time. Combination head screws are used to ease installation. All terminals are clearly marked to ease wiring.
- 3 Location for 5 characters (number and/or letter) terminal identification. See page 49 for complete listing of available markers.
- 4 Mounts on the common 35mm DIN 3 track or the DIN 1 track. See pages 47-48 for complete listing of available track.





ABA-6DA81



ABA-6DA123



ABE-6HE14M



ABF-H14H020



ABC-6HE14F



ABF-C14N050

Digital input (from PLC)	Analog output (to field device)	Catalog No.	Standard Pack	Weight lb/kg
8 bit	0-10 VDC	ABA-6DA81	1	.12/0.056
	± 10 VDC	ABA-6DA80	1	.12/0.056
	0-20 mA	ABA-6DA83	1	.12/0.056
12 bit	0-10 VDC	ABA-6DA121	1	.12/0.056
	± 10 VDC	ABA-6DA120	1	.12/0.056
	0-20 mA	ABA-6DA123	1	.12/0.056

Cabling Accessories

Description	Catalog No.	Standard Pack	Weight (lb/kg)
Terminal block connector - 14 pole	ABE-6HE14M	1	0.17/0.075
.2 M Ribbon cable with female connectors	ABF - H14H020	1	0.02/0.008
Female connectors	ABC-6HE14F	2	0.01/0.005
5 M Ribbon cable	ABF-C14N050	1	1.15/0.520



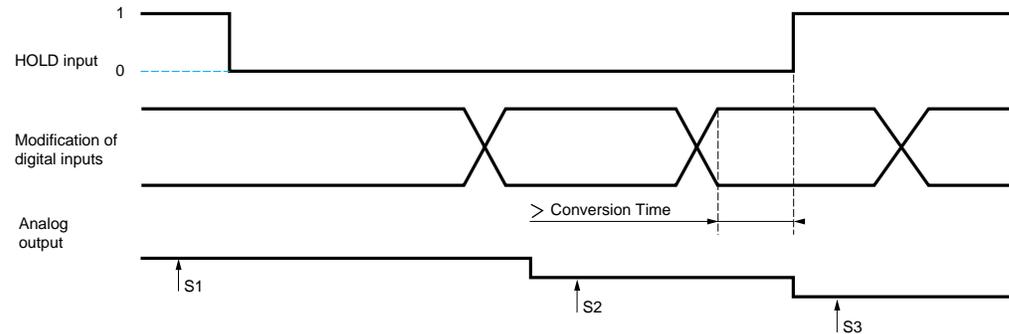


Operation

ABA-6DA modules convert digital to analog signals on command from the processing unit in the form of a discrete 24 VDC "HOLD" signal, as shown in the diagram below.

This mode of operation enables several modules to be connected in parallel to the same discrete outputs on the processing unit thus creating a simple multiplexing of several analog outputs.

Operating Diagram



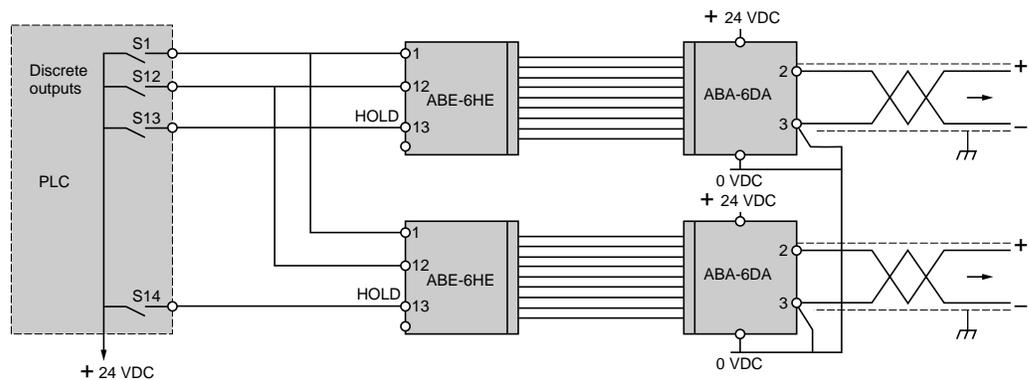
The principles of analog measurement must be observed, in particular :

- shielded twisted pair cable should be used, minimum cross-section 24AWG10.22 mm².
- only circuits with the same earth reference should be connected in the same multipair cable.
- measurement cables should be kept separate from discrete I/O cables (especially those of relay outputs) and power cables.
- parallel routing should be avoided (there should be at least 7.8 in./20 cm between cables) and intersections should be made at right angles.

Cabling digital inputs

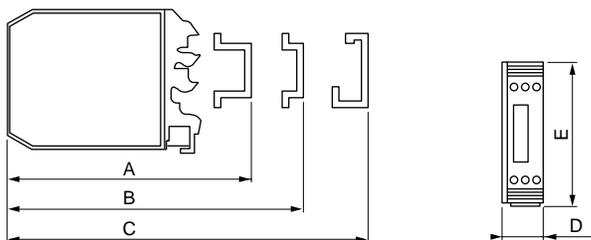
They are connected using a ribbon cable fitted with 2 14-pin female connectors. Terminal block connector ABE-6HE14M is used to connect the individual wires of the cable to the screw terminals.

Multiplexing several analog outputs (diagram for analog outputs with 12 bit converters)



Dimensions

ABA-6DA



	Inches	mm
A	3.86	98.0
B	3.56	90.5
C	3.74	95.0
D	0.89	22.5
E	2.39	60.6





Approvals	UL File E 39281, CSA pending and IEC			
Conforming to standards	IEC 947-1; VDE 0110b. UL 508			
Degree of protection	Conforming to IEC-529 (protection against direct contact)			IP 20B
Protective treatment	Tropical Climate			
Flame resistance	Conforming to IEC 696-2-1	Incandescent wire		1562°F/850°C
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves		50 g
Vibration resistance	Conforming to IEC 68-2-6	10-55 Hz		5 g
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 3	kV	8
Radio Frequency Immunity	Conforming to IEC 801-3	Level 3	V/m	10
Resistance to rapid transients	Conforming to IEC 801-4 Level 3	On supply	kV	2
		On I/O	kV	1
Resistance to shock waves	Conforming to IEC 255-4	Waveform 1.2/50 µs; 0.5 J	kV	0.5
Cross-sections which can be connected	Flexible cable, no cable end	1 wire		20 to 14 AWG / 0.5 to 2.5 mm ²
	Flexible cable with cable end	1 wire		24 TO 14 AWG / 0.22 to 2.5 mm ²
		2-wire		24 TO 18 AWG / 0.2 to 1.5 mm ²
	Solid cable	1 wire		20 TO 14 AWG / 0.5 to 2.5 mm ²
Operating position	Any			
Ambient air temperature around the device	Operation	Mounted vertically, touching		32 to 104°F/0 to 40°C
		Devices 2 cm apart		32 to 122°F/0 to 50°C
	Storage			-40 to 185°F/-40 to 85°C
Insulation voltage	Terminals/fixing rails		kV	2
Installation category	Conforming to IEC 947-1			
Degree of pollution	Conforming to IEC 947-1			
Mounting	Standard rails			
				see pages 47-48

Special Characteristics

Digital input			8 bits	12 bits	
Supply	Supply voltage	VDC	24 ± 20 % Including ripple	24 ± 20 % Including ripple	
	Maximum voltage without damage	VDC	±30	±30	
	Maximum current consumed	mA	55	70	
Analog output	Voltage	Range	VDC	0-10	
		Maximum voltage in serial mode	VDC	±15	
		VDC output impedance	kOhm	100	
	Current	Built-in protection		Reversed polarity	Reversed polarity
		Range	mA	0-20	0-20
		Maximum voltage in serial mode	VDC	±15	±15
	VDC output impedance	mOhm	>5	>5	
	Built-in protection		Reversed polarity	Reversed polarity	
“HOLD” and Discrete digital input	Rated voltage	VDC	24	24	
	Maximum voltage	VDC	30	30	
	State 1 (ON) $U \geq ; I \geq$		18 VDC; 0.4 mA	18 VDC; 0.4 mA	
	State 0 (OFF) $U \leq ; I \leq$		12 VDC; 0.2 mA	12VDC ; 0.2 mA	
	Conversion time	µs	20	13	
Conversion	Non linearity		± 1/2 LSB	± 1/4 LSB	
		Maximum error at 68°F/20°C ▲	± 1/2 LSB	± 1/2 LSB	
	Temperature error	0-10 VDC output	ppm/°K	50	25
		0-20 mA output	ppm/°K	50	40
	coefficient	±10 VDC	ppm/°K	100	35
		Resolution	0-10 VDC output	mV	39
	±10 VDC output		mV	78.1	4.883
	0-20 mA output		µA	78.1	4.883

▲ On a voltage output load ≥ 1 M Ohm



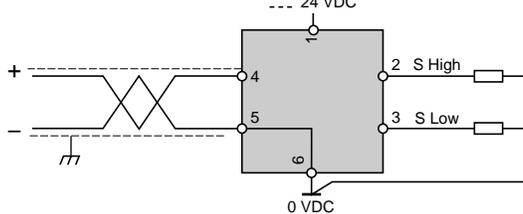
Analog Threshold Detectors



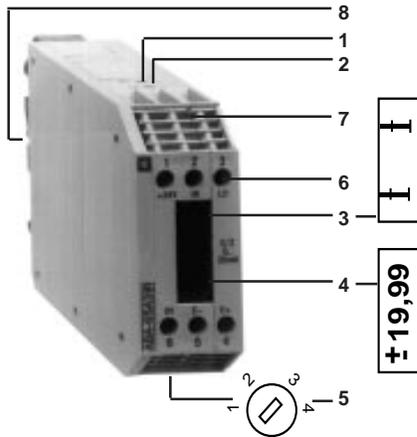
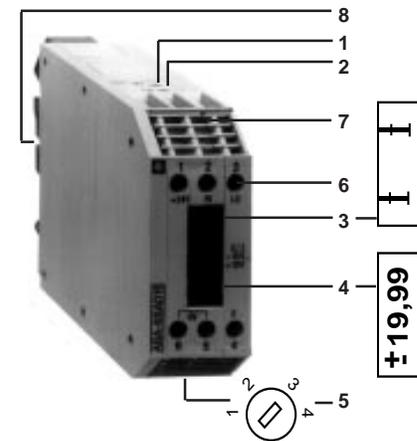
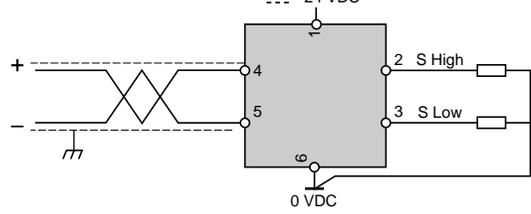
The function of these modules is to monitor the level of a standard analog signal (0-10 VDC; 0-20 mA) in relation to fixed preset thresholds. They provide 2 discrete signals representing the state of the signal in relation to the "High" and "Low" limits.

The main use for analog threshold detectors is in simple applications. They offer a low-cost solution to provide discrete regulation functions (High Level/Low Level), pressure switch type functions, and functions where pressure regulators are used with analog output sensors.

ABA-6SA●●S (Solid State)



ABA-6SA●●R (Relay)



The ABA-6SA range is comprised of two types of products, available in two versions, with or without liquid crystal display (LCD) :

Threshold detectors with solid state outputs

These interfaces have two 24 VDC transistor outputs for switching a current of up to 50 mA. The outputs are directly compatible with the inputs of a PLC. They must be interfaced for controlling preactuators.

The analog input is not isolated from the discrete outputs and the module power supply.

Input range : ± 10 V DC
0-20 mA

Threshold detectors with relay outputs

These interfaces have two relay outputs whose common is connected to the 24 VDC module supply. The relays switch a current of up to 2 A. The outputs are directly compatible with the inputs of a PLC. They can directly control preactuators requiring up to 12 W.

The analog input is differential and isolated from the discrete outputs and the module supply.

Input range : ± 10 V DC
0-20 mA

- 1 Potentiometer for adjusting upper threshold "High"
- 2 Potentiometer for adjusting lower threshold "Low"
- 3 Test points for measuring the signal and the thresholds using a digital voltmeter (only versions without displays).
- 4 Liquid crystal display (LCD) (only versions with displays)
- 5 Switch for selecting the value to be displayed
 - 1 and 4 : input signal
 - 2 : "Low" threshold
 - 3 : "High" threshold
- 6 The screw clamp terminals provide secure termination of one or two (stranded or solid) wires. The terminals are shipped backed out so that each terminal is ready to accept wires right out of the box, saving on installation time. Combination head screws are used to ease installation. All terminals are clearly marked to ease wiring.
- 7 Location for 5 character (number and/or letter) terminal identification. See page 49 for complete listing of available markers.
- 8 Mounts on the common 35 mm DIN 3 or the DIN 1 track. See pages 47-48 for complete listing of available track.



Analog Threshold Detectors



ABA-6SA01S



ABA-6SA31R

Type	Input signal (from field device)	24V Discrete outputs (to PLC)	I/O isolation	Catalog No.	Standard Pack	Weight lb./kg	
Without display	± 10 VDC	Solid state	Without	ABA-6SA00S	1	.140.065	
		Relay	With	ABA-6SA00R	1	.140.065	
	0-20 mA	Solid state	Without	ABA-6SA30S	1	.140.065	
		Relay	With	ABA-6SA30R	1	.140.065	
	With LCD display	± 10 VDC	Solid state	Without	ABA-6SA01S	1	.140.065
			Relay	With	ABA-6SA01R	1	.140.065
0-20 mA		Solid state	Without	ABA-6SA31S	1	.140.065	
		Relay	With	ABA-6SA31R	1	.140.065	



Analog Threshold Detectors

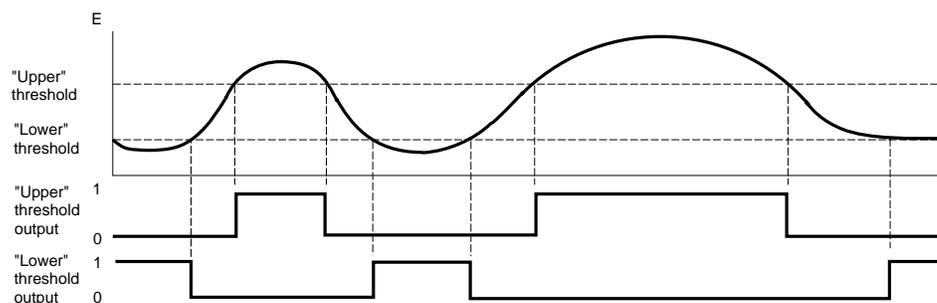


Operation

The setpoint thresholds are set using two potentiometers located on the module face. Adjustment is made easy by monitoring the setpoint value at two test points on the front of the module (version without display) or by reading the value on the digital display. (Option selector switch must be set for this feature).

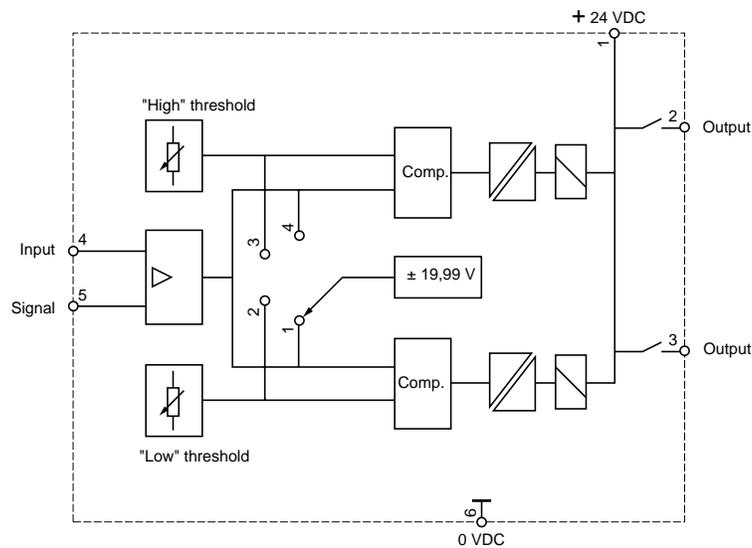
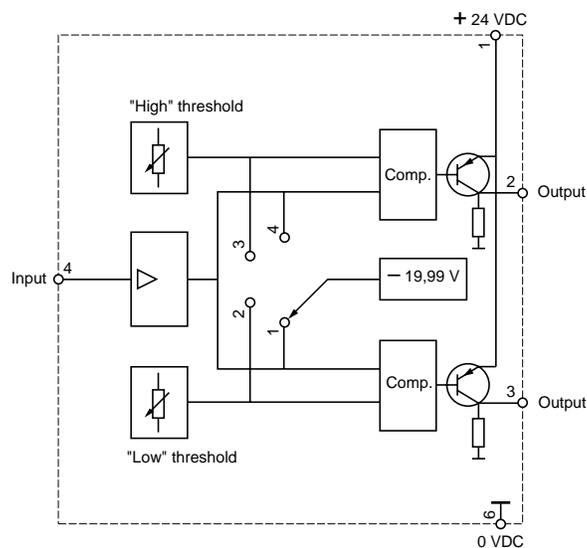
A digital voltmeter set to 2 VDC is used for performing measurements at the test points.

Operating diagram



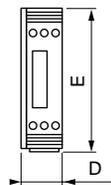
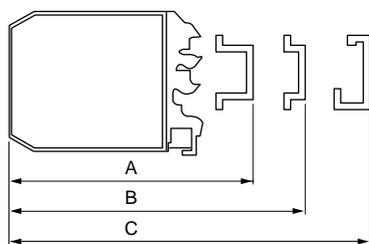
ABA-6SA●●S

ABA-6SA●●R



Dimensions

ABA-6SA●●S/R



	Inches	mm
A	3.86	98.0
B	3.56	90.5
C	3.74	95.0
D	0.89	22.5
E	2.39	60.6





Approvals	UL File E 39281, CSA pending and IEC			
Conforming to standards	IEC 947-1; VDE 0110b. UL 508			
Degree of protection	Conforming to IEC-529 (protection against direct contact)			IP 20B
Protective treatment				Tropical Climate
Flame resistance	Conforming to IEC 696-2-1	Incandescent wire		1562°F/850°C
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves		50 g
Vibration resistance	Conforming to IEC 68-2-6	10-55 Hz		5 g
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 3	kV	8
Radio Frequency Immunity	Conforming to IEC 801-3	Level 3	V/m	10
Resistance to rapid transients	Conforming to IEC 801-4 Level 3	On supply	kV	2
		On I/O	kV	1
Resistance to shock waves	Conforming to IEC 255-4	Waveform 1.2/50 µs; 0.5 J	kV	0.5
Cross-sections which can be connected	Flexible cable, no cable end	1 wire		20 to 14 AWG / 0.5 to 2.5 mm ²
	Flexible cable with cable end	1 wire		24 TO 14 AWG / 0.22 to 2.5 mm ²
		2-wire		24 TO 18 AWG / 0.2 to 1.5 mm ²
	Solid cable	1 wire		20 TO 14 AWG / 0.5 to 2.5 mm ²
Operating position	Any			
Ambient air temperature around the device	Operation	Mounted vertically, touching		32 to 122°F/0 to 50°C
		Devices 2 cm apart		32 to 140°F/0 to 60°C
	Storage			-40 to 185°F/-40 to 85°C
Insulation voltage	Terminals/fixing rails		kV	2
Installation category	Conforming to IEC 947-1			II
Degree of pollution	Conforming to IEC 947-1			2
Mounting	Standard rails			see pages 47-48

Special Characteristics

Reference			ABA-6SA●●S	ABA-6SA●●R	
Power supply	Supply voltage	VDC	24 ± 20 % including ripple	24 ± 20 % including ripple	
	Maximum voltage without damage	VDC	30	30	
	Maximum current	mA	7 + output current	30 + output current	
	Built-in protection		Reversed polarity	Reversed polarity	
Input	Voltage	Range	VDC	±10	±10
		Filtering		LC filtering	LC filtering
		Passband	Hz	1000	100
		Maximum voltage in common mode	VDC	NA	± 500
		Maximum voltage in serial mode	VDC	± 50	± 50
		VDC input impedance	kOhm	≥ 200	≥ 200
		Built-in protection		Reversed polarity	Reversed polarity
		Current	Range	mA	0...20
	Filtering			LC filtering	LC filtering
	Passband		Hz	1000	100
	Maximum voltage in common mode		VDC	NA	500
	Maximum voltage in serial mode		VDC	5	5
	VDC input impedance		Ohm	100	100
	Built-in protection		Reversed polarity	Reversed polarity	
Digital display	Type		LCD 3.5 digits ± 19.99	LCD 3.5 digits ± 19.99	
	Indication		Sign + measurement	Sign + measurement	
	Height of digits	mm	5	5	
	Precision of displays		± 2 digits	± 2 digits	
	Resolution		10 mV/10 µA	10 mV/10 µA	
Adjustment of thresholds	Voltage range	VDC	± 10	± 10	
	Current range	mA	0-20	0-20	
Discrete outputs	Type		Positive logic transistor	N/O relay contact	
	Voltage	VDC	24	24	
	Maximum current	A	0.05	2 resistive load 0.1 inductive load	
Switching	Hysteresis		20 mV/20 µA	20 mV/20 µA	
	Error in range at 68 °F/20 °C		10 mV/10 µA	10 mV/10 µA	
	Temperature error coefficient	ppm/°K	75	75	
	Error in range at 140 °F/60 °C	%	0.4 full scale	0.4 full scale	
	Analog input/24 VDC supply	V eff	NA	500	
Open contacts	V eff	NA	750		



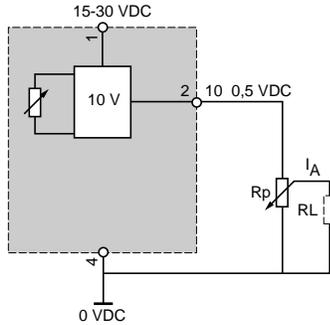
Potentiometer Reference Supply



The function of these modules is to generate a stable reference voltage (or current) to supply a potentiometer from a 24VDC voltage.

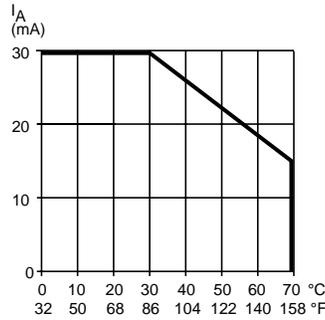
These reference sources are used with precision potentiometers for setpoint displays, or detection of linear or rotational positions.

Diagrams ABA-6LP01

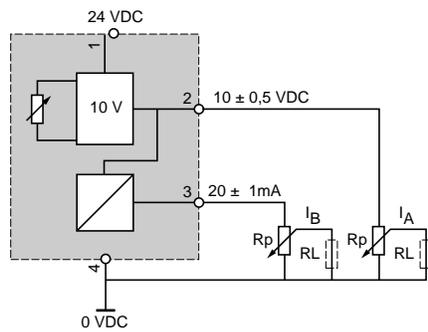


$$\frac{R_p \times R_L}{R_L + R_p} \quad 330 \text{ W}$$

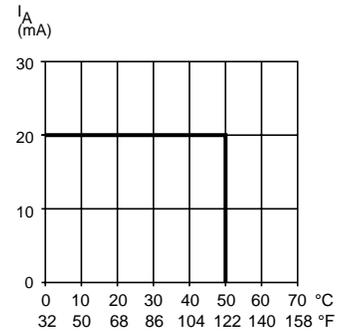
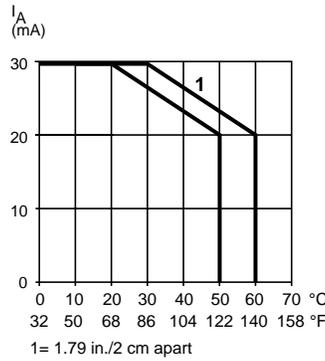
Ambient temperature derating curves



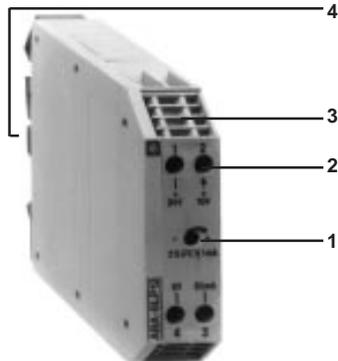
ABA-6LP12



$$R_p \quad 500 \text{ W} \quad \frac{R_p \times R_L}{R_p + R_L} \quad 330 \text{ W}$$



1= 1.79 in./2 cm apart



There are 2 versions of the ABA-6LP voltage reference source in the range:

- a 10 VDC ± 0.5 VDC voltage source
- a 10 VDC ± 0.5 VDC voltage source plus a 20 mA ± 1 mA current source.

1 Potentiometer for adjustment of voltage or current to compensate for the imprecision of the external potentiometer and adjust the full scale.

2 The screw clamp terminals provide secure termination of one or two (stranded or solid) wires. The terminals are shipped backed out so that each terminal is ready to accept wires right out of the box, saving on installation time. Combination head screws are used to ease installation. All terminals are clearly marked to ease wiring.

3 Location for 5 character (number and/or letter) terminal identification. See page 49 for complete listing of available markers.

4 Mounts on the common 35mm DIN 3 or DIN 1 track. See pages 47-48 for complete listing of available track.



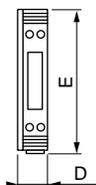
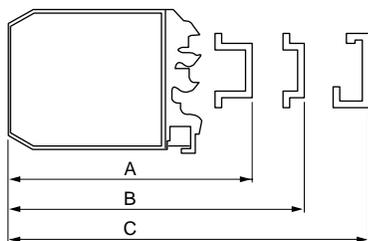
Potentiometer Reference Supply



ABA-6LP12

Input Supply	Output Voltage	Output Current	Catalog No.	Standard Pack	Weight
VDC	VDC	mA			lb./kg
15-30	10	-	ABA-6LP01	1	.15/0.070
24	10	20	ABA-6LP12	1	.15/0.070

Dimensions



	Inches	mm
A	3.86	98.0
B	3.56	90.5
C	3.74	95.0
D	0.89	22.5
E	2.39	60.6



Potentiometer Reference Supply



Approvals	ULFile E 39281, CSA pending and IEC		
Conforming to standards	IEC 947-1 ; VDE 0110b UL 508		
Degree of protection	Conforming to IEC 529 (protection against direct contact)		IP 20B
Protective treatment	Tropical Climate		
Flame resistance	Conforming to IEC 696-2-1	Incandescent wire	1562 °F / 850 °C
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves	50 g
Vibration resistance	Conforming to IEC 68-2-6	11 ms	5 g
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 2	kV 4
Radio Frequency Immunity	Conforming to IEC 801-3	Level 2	V/m 3
Resistance to rapid transients	Conforming to IEC 801-4	On supply	kV 2
	Level 3	On I/O	kV 1
Resistance to shock waves	Conforming to IEC 255-4	Waveform 1.2/50 μs ; 0.5 J	kV 0.5
Cross-sections which may be connected	Flexible cable, no cable end	1 wire	20 to 14 AWG / 0.5 to 2.5 mm ²
	Flexible cable with cable end	1 wire	24 to 14 AWG / 0.22 to 2.5 mm ²
	Solid cable	2-wire	24 to 18 AWG / 0.2 to 1.5 mm ²
		1 wire	22 to 14 AWG / 0.5 to 2.5 mm ²
Operating position	Any		
Ambient air temperature around the device	Operation	Mounted vertically, touching	°C See curve page 14
		Devices 2 cm apart	°C See curve page 14
	Storage		°C -40° to 185°/-40-85°C
Insulation voltage	Terminals/fixing rails		kV 2
Installation category	Conforming to IEC 947-1		II
Degree of pollution	Conforming to IEC 947-1		2
Mounting	Standard rails		see pages 47-48

Special Characteristics

Reference			ABA-6LP01	ABA-6LP12	
Power supply	Supply voltage	VDC	15-30	24 ± 20 %	
	Maximum voltage without damage	VDC	30	30	
	Maximum current	mA	10 + output current	10 + output current	
	Built-in protection		Reversed polarity	Reversed polarity	
Output	Voltage	Rated voltage	VDC	10	
		Voltage adjustment range	VDC	± 0.5	
		Maximum current	mA	30 (see curve page 14)	20 (see curve page 14)
		Effect of the load	%	≤ 0.25 (25mV)	≤ 0.25 (25mV)
	Current	Effect of the temperature	ppm/°K	30	30
		Rated current	mA	NA	20
		Current adjustment range	mA	NA	± 1
		Load	Ohm	NA	≤ 500
Effect of 0 to 500 Ohm load	%	NA	≤ 0.25 full scale (50uA)		
Effect of the temperature	ppm/°K	NA	40		



Notes



Voltage/Current Analog Transmitters

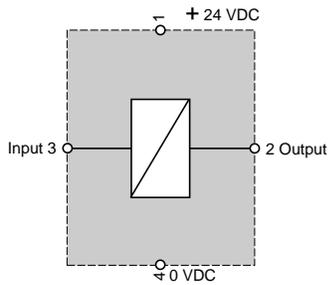


The functions of the voltage/current analog transmitter in automated control and monitoring systems include:

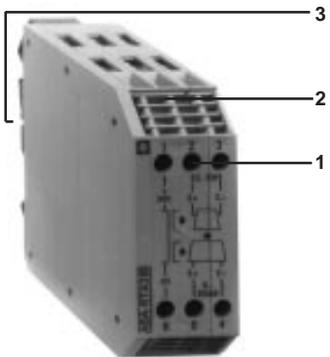
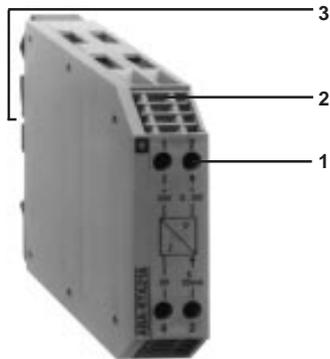
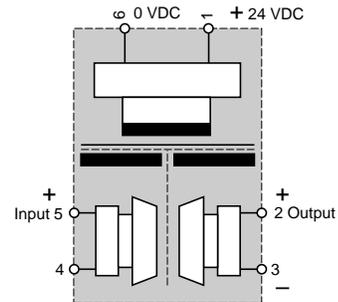
- adapting signals sent from sensors to make them compatible with the receiving equipment (regulator; PLC; measurement station , etc)
- adapting output signals (setpoints) sent from processing units (PLCs; PCs; etc) to preactuators (speed controllers; regulators; progressive valves, etc)
- increasing the transmission distance and providing good immunity against interference (transforming a voltage signal to a current signal)

The products are characterised by: a single 24 VDC power source; a high level of precision; and a high passband of up to 100 Hz which is suitable for most industrial process applications.

Non isolated transmitter ABA-6TA●●A



Isolated transmitter ABA-6TA●●B



The ABA-6TA range is comprised of 2 types :

Non-isolated transmitters

These interfaces are designed for applications where electrical isolation between the input and the output is not required.

Isolated transmitters

These interfaces are designed for applications where electrical isolation between the transmitting and receiving equipment is necessary.

They provide isolation between the signals themselves, and between the signals and the 24 VDC interface supply.

- 1 The screw clamp terminals provide secure termination of one or two (stranded or solid) wires. The terminals are shipped backed out so that each terminal is ready to accept wires right out of the box, saving on installation time. Combination head screws are used to ease installation. All terminals are clearly marked to ease wiring.
- 2 Location for 5 character (number and/or letter) terminal identification. See page 49 for complete listing of available markers.
- 3 Mounts on the common 35 mm DIN 3 or the DIN 1 track. See pages 47-48 for complete listing of available track.



Voltage/Current Analog Transmitters



ABA-6TA21A

Electrical isolation	Input signal (From Field Device)	Output signal (to PLC)	Catalog No.	Standard Pack	Weight lb.kg
Without	0-10 VDC	4-20 mA	ABA-6TA12A	1	.14/0.065
		0-20 mA	ABA-6TA13A	1	.14/0.065
	4-20 mA	0-10 VDC	ABA-6TA21A	1	.14/0.065
	0-20 mA	0-10 VDC	ABA-6TA31A	1	.15/0.065
With	±10 VDC	± 10 VDC	ABA-6TA00B	1	.14/0.065
		0-10 VDC	ABA-6TA13B	1	.14/0.065
	4-20 mA	0-10 VDC	ABA-6TA21B	1	.14/0.065
		0-20 mA	ABA-6TA23B	1	.14/0.065
	0-20 mA	0-10 VDC	ABA-6TA31B	1	.15/0.065
		0-20 mA	ABA-6TA33B	1	.15/0.065
		4-20 mA	ABA-6TA32B	1	.15/0.065



ABA-6TA31B

Analog signals

Electrical isolation	Input (From Field Device)	Output (to PLC)			
		± 10 V	0-10 V	4-20 mA	0-20 mA
Without	0-10 VDC	No	No	Yes	Yes
	4-20 mA	No	Yes	No	No
	0-20 mA	No	Yes	No	No
With	± 10 VDC	Yes	No	No	No
	0-10 VDC	No	Yes ■	No	Yes
	4-20 mA	No	Yes	Yes ▲	Yes
	0-20 mA	No	Yes	Yes	Yes

■ By using ± 10 V model
▲ By using 0-20 mA model

Functions of the voltage/current analog transmitters



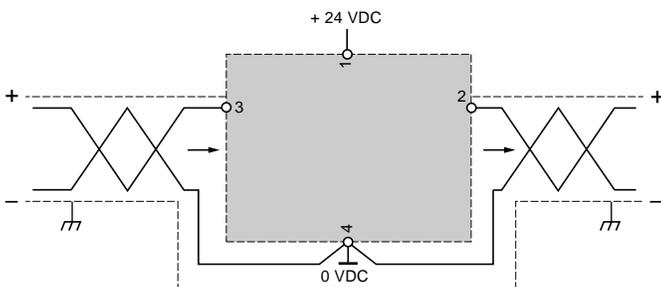
Voltage/Current Analog Transmitters



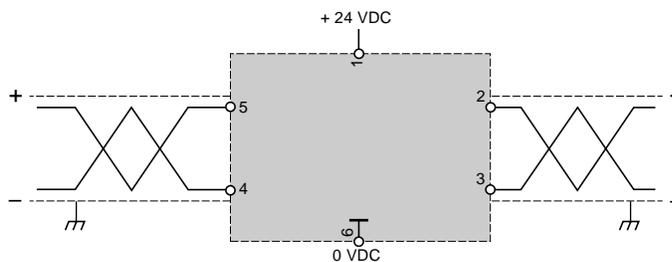
Approvals	UL File E39281, CSA pending and IEC		
Conforming to standards	IEC 947-1; VDE 0110b, UL 508		
Degree of protection	Conforming to IEC 529 (protection against direct contact)		IP 20B
Protective treatment	Tropical Climate		
Flame resistance	Conforming to IEC 695-2-1	Incandescent wire	1562°F/850°C
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves 11 ms	50 g
Vibration resistance	Conforming to IEC 68-2-6	10-55 Hz	5 g
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 3	kV 8
Radio Frequency Immunity	Conforming to IEC 801-3	Level 3	V/m 10
Resistance to rapid transients	Conforming to IEC 801-4 Level 3	On supply	kV 2
		On I/O	kV 1
Resistance to shock waves	Conforming to IEC 255-4	Waveform 1.2/50 μs ; 0.5 J	kV 0.5
Cross-sections which may be connected	Flexible cable, no cable end	1 wire	20 to 14 AWG / 0.5 to 2.5 mm ²
	Flexible cable with cable end	1 wire	24 to 14 AWG / 0.22 to 2.5 mm ²
		2-wire	24 to 18 AWG / 0.2 to 1.5 mm ²
Solid cable	1 wire	20 to 14 AWG / 0.5 to 2.5 mm ²	
Operating position	Any		
Ambient air temperature around the device	Operation	Mounted vertically, touching	32 to 122°F/0 to 50°C
		Devices 2 cm apart	32 to 140°F/0 to 60°C
	Storage		-40 to 185°F/-40 to 85°C
Insulation voltage	Terminals/fixing rails		kV 2
Installation category	Conforming to IEC 947-1		II
Degree of pollution	Conforming to IEC 947-1		2
Mounting	Standard rails		see pages 47-48

Connections

Non Isolated Transmitter



Isolated Transmitter



The principles of analog measurement must be observed, in particular :

- Shielded twisted pair cable should be used, minimum cross-section 24AWG/0.22 mm².
- Only circuits with the same ground should be connected in the same multipair cable.
- The measurement cables should be kept separate from the discrete I/O cables (especially those of relay outputs) and power cables.
- Parallel routing should be avoided (there should be at least 7.8in/20 cm between cables) and intersections should be at right angles.
- Connect the shield to the ground of the receiver component.



Special Characteristics

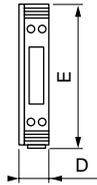
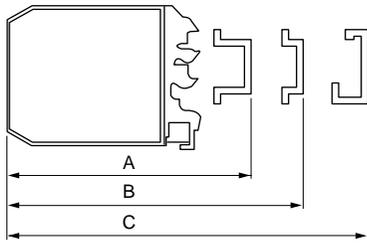
Type of interface			ABA-6TA●●A (Non Isolated)	ABA-6TA●●B (Isolated)	
Supply		Supply voltage	VDC	24 ± 20 % including ripple	24 ± 20 % including ripple
	Maximum current	Maximum voltage without damage	VDC	30	30
		Voltage output	mA	27	102
		Current output	mA	42	117
		Built-in protection		Reversed polarity	Reversed polarity
Input	Voltage	Range	VDC	0 - 10	0 - 10 / ± 10
		Filtering		LC filter	LC filter
		Passband	Hz	100	100
		Attenuation (F > 100 Hz)	%/kHz	1	1
		Maximum voltage in common mode	VDC	NA	15
		Maximum voltage in serial mode	VDC	60	60
		VDC input impedance	k Ohm	≥ 200	≥ 200
	Built-in protection		Reversed polarity	Reversed polarity	
	Current	Range	mA	0 - 20 ; 4 - 20	0 - 20 ; 4 - 20
		Filtering		LC filter	LC filter
		Passband	Hz	100	100
		Maximum voltage in common mode	VDC	NA	15
		Maximum voltage in serial mode	VDC	3.5	3.5
		VDC input impedance	Ohm	50	50
		Built-in protection		Reversed polarity	Reversed polarity
Output	Voltage	Range	VDC	0 - 10	0 - 10 ± 10
		Maximum voltage in common mode	VDC	NA	630
		Maximum voltage in serial mode	VDC	60	60
		VDC output impedance	Ohm	100	100
		Minimum load	kOhm	100	100
		Residual ripple		NA	30 mV ; 40 kHz
		Built-in protection		Reversed polarity Short-circuits Overvoltages	Reversed polarity Short-circuits Overvoltages
	Current	Range	mA	0 - 20 ; 4 - 20	0 - 20 ; 4 - 20
		Maximum voltage in common mode	VDC	NA	630
		Maximum voltage in serial mode	VDC	3.5	3.5
		VDC output impedance	mOhm	5	5
		Maximum load	Ohm	500	500
		Residual ripple		NA	30 mV ; 40 kHz
		Built-in protection		Reversed polarity Short-circuits Overvoltages	Reversed polarity Short-circuits Overvoltages
Transfer		Error at 68 °F/20 °C	%	± 0.2 full scale	± 0.1 full scale
		Error on 32 to 140 °F/0 to 60 °C range	%	± 0.8 full scale	± 0.9 full scale
		Temperature error coefficient	%/°K	± 0.015 full scale	± 0.02 full scale
Isolation		I/O	kV	NA	1.5
		Input and output/supply	kV	NA	1.5



Voltage/Current Analog Transmitters

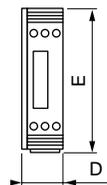
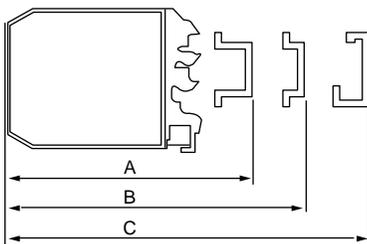


ABA-6TAIIA



	Inches	mm
A	3.86	98.0
B	3.56	90.5
C	3.74	95.0
D	0.65	16.5
E	2.39	60.6

ABA-6TAIIB



	Inches	mm
A	3.86	98.0
B	3.56	90.5
C	3.74	95.0
D	0.89	22.5
E	2.39	60.6



Notes



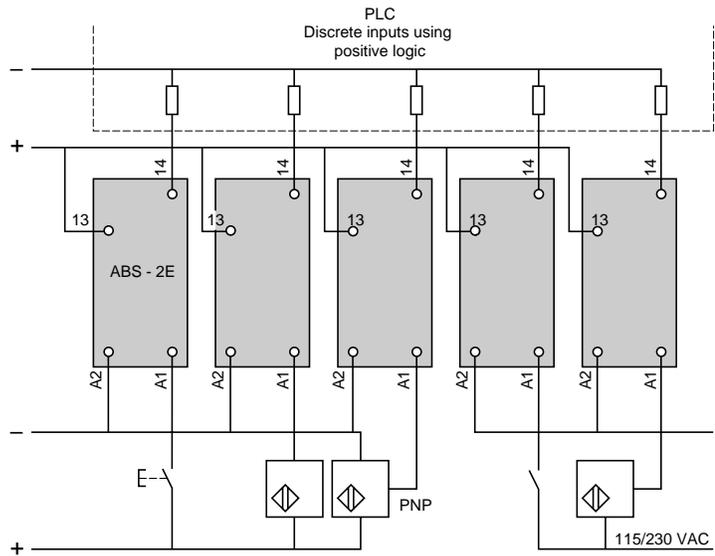
Solid State Relay Interface Modules



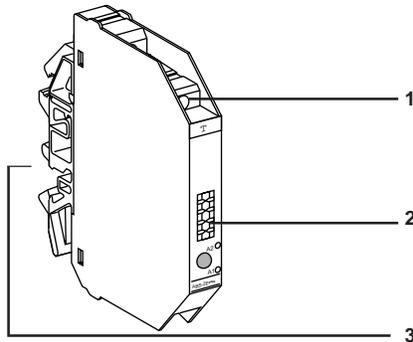
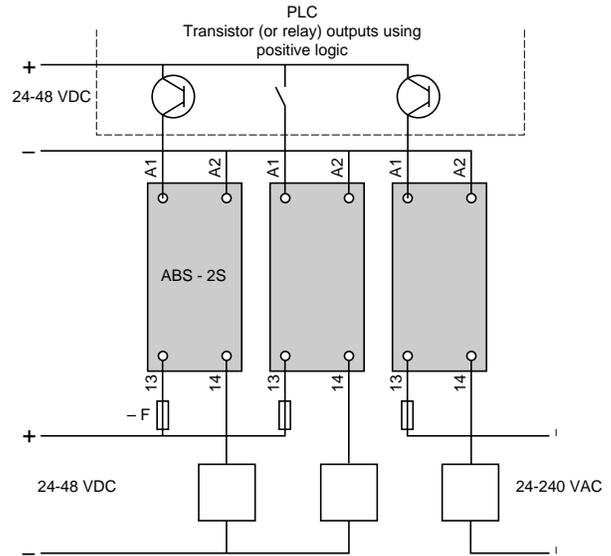
The ABS-2 solid state relay interface modules are designed for interfacing discrete digital control signals exchanged in automation equipment between a PLC, and field devices (contactors, solenoid valves, pilot lights, proximity sensors...).

They are used in equipment requiring the advantages of electronic technology : high operating rate, silent operation.

Interfacing of discrete PLC inputs



Interfacing of discrete PLC outputs

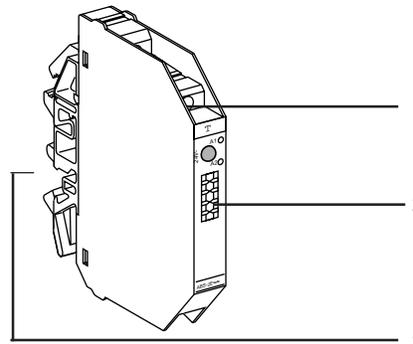


The ABS-2 range is comprised of 2 Types:

Input interface modules.

The input interface modules are designed for switching discrete input signals in automation systems. They offer a wide range of voltages from 5 VDC to 230 VAC and are only .38 in./9.5mm wide.

The ABS-2 input module allows the use of a sourcing sensor with a sourcing PLC input point.



Output interface modules

The output interface modules are designed for the control of preactuators (contactors, solenoid valves...) and signalling units (pilot lights, audible alarms...).

They are available in two widths of .38 in./9.5mm and .69 in./17.5 mm depending on the current rating.

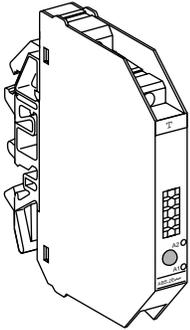
The .69in./17.5 mm version improves ventilation and enables high current switching.

- 1 The screw clamp terminals provide secure termination of one or two (stranded or solid) wires. The terminals are shipped backed out so that each terminal is ready to accept wires right out of the box, saving on installation time. Combination head screws are used to ease installation. All terminals are clearly marked to ease wiring.
- 2 Location for 5 character (number and/or letter) terminal identification. See page 49 for complete listing of available markers.
- 3 Mounts on the common 35 mm DIN 3 or the DIN 1 track. See pages 47-48 for complete listing of available rack.

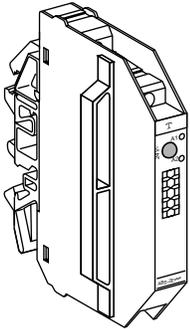




Input Modules



Input circuit	Output circuit	Catalog No.	Standard Pack	Weight
Rated voltage V	Rated voltage V			lb./kg
5 VDC	5-48 VDC	ABS-2EC01EA	1	.06/0.029
24 VDC	5-48 VDC	ABS-2EC01EB	1	.06/0.029
48 VDC	5-48 VDC	ABS-2EC01EE	1	.06/0.029
120-127 (60 Hz)	5-48 VDC	ABS-2EA02EF	1	.06/0.029
230-240 (60 Hz)	5-48VDC	ABS-2EA02EM	1	.07/0.033

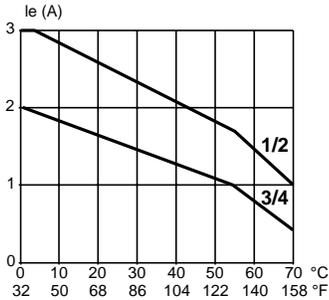


Output Modules

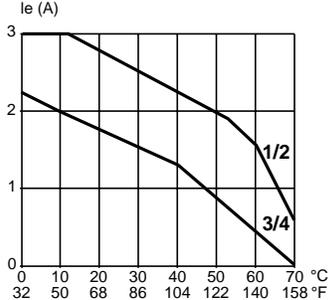
Control circuit	Output circuit	Catalog No.	Standard Pack	Weight
Rated voltage (Uc) V	Current Rated voltage V			lb./kg
24 VDC	2.0 A 5-48 VDC	ABS-2SC01EB	1	.08/0.034
	2.3 A 24-240 VAC	ABS-2SA01MB	1	.08/0.034
24 VDC	3.0 A 5-48 VDC	ABS-2SC02EB	1	.10/0.044
	3.0 A 24-240 VAC	ABS-2SA02MB	1	.10/0.044

Derating Curves for Solid State Relay Interface Output Modules $U_c = U_s = 24 \text{ V DC}$

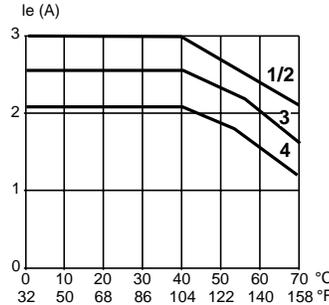
ABS-2SC01EB



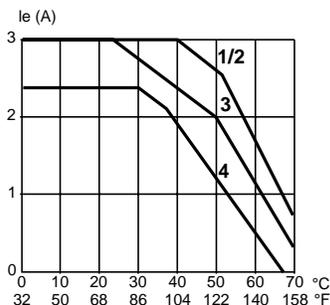
ABS-2SA01MB



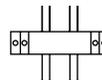
ABS-2SC02EB



ABS-2SA02MB



- 1 Vertical module alone or adjacent to modules with low heat dissipation.
- 2 Horizontal module alone or adjacent to modules with low heat dissipation.



- 3 Vertical module with 2 modules mounted on either side with identical heat dissipation.
- 4 Horizontal module with 2 modules mounted on either side with identical heat dissipation.



Solid State Relay Interface Modules



Input and Output Module Characteristics

Approvals	UL File E 39281, CSA LR 81630-38 and IEC		
Conforming to standards	IEC 947-5-1 Draft standard IEC 17 B secretariat 200, UL 508		
Degree of protection	Conforming to IEC-529 (protection against direct contact)		IP 20B
Protective treatment			Tropical Climate
Flame resistance	Conforming to IEC 695-2-1	Incandescent wire	1730°F/960°C
Shock resistance	Conforming to IEC 68-2-27	Conforming to UL 94 11 ms half sine waves	gn 30
Vibration resistance	Conforming to IEC 68-2-6	10-150 Hz	gn 5
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 3	kV 8
Radio Frequency Immunity	Conforming to IEC 801-3	Level 3 27...1000 MHz	V/m 10
Resistance to fast interference	Conforming to IEC 801-4 Level 3	On supply	kV 2
Resistance to shock waves	Conforming to IEC 947-1 1.2/50 µs wave ; 0.5 J	On supply/output	kV 1
		U<50 V	kV 0.5
		U<150 V	kV 1.5
		U<300 V	kV 2.5
Cable capacity	Flexible cable without cable end	1 or 2 conductors	20 to 14 AWG / 0.6 to 2.5 mm ²
	Flexible cable without cable end	1 or 2 conductors	22 TO 14 AWG / 0.34 to 2.5 mm ²
	Rigid cable	1 conductor	24 TO 12 AWG / 0.27 to 4 mm ²
Operating position			Any
Ambient air temperature around the device	For operation without restriction		23 to 131°F/-5 to 55°C
	For operation at Us		-13 to 158°F/-25 to 70°C
	For storage		-40 to 170°F/-40 to 80°C
Operating altitude			m ≤ 3000
Installation category	Conforming to IEC 947-1		II
Degree of pollution	Conforming to IEC 947-1		2
Mounting	Standard rails		see pages 47-48



Control Circuit Characteristics / Input Modules (at 131°F/55°C ambient temperature)

Type of interface module			ABS-2 EC01EA	ABS-2 EC01EB	ABS-2 EC01EE	ABS-2 EA02EF	ABS-2 EA02EM
Rated voltage U _s	VDC		5	24	48		
	VAC					120/127 60 Hz	230/240 60 Hz
Maximum voltage	VDC		6 (TTL)	28.8	57.6		
	VAC					140	264
Maximum current at U _s	DC	mA	13.6	12	10.5		
	AC	mA				17	15
State 1 (on) guaranteed	VDC		3.75	16.9	36		
	mA		4.5	7.7	7.5		
	VAC					90	173
State 0 (off) guaranteed	mA					9.7	9.3
	VDC		2	5.6	10.8		
	mA		0.09	2	2		
	VAC					25.4	48
	mA					2.5	2.5
State 1 (on) display		yes	yes	yes	yes	yes	
Internal protection against reverse polarity		yes	yes	yes	NA	NA	

Output Circuit Characteristics

Rated operational voltage U _e	VDC	5 to 48
Min./max. voltage	VDC	2/60
Min./max. switching current	mA	1/50
Max. residual current in state 0(off)	mA	0.1
Max. voltage drop in state 1 (on)	VDC	1
Internal protection		Against reverse polarity
External protection ■		Against short-circuits for I _k ≤ 100 A (DC) Fast acting 0.25 A fuse required

Other Characteristics

Type of interface module			ABS-2 EC01EA	ABS-2 EC01EB	ABS-2 EC01EE	ABS-2 EA02EF	ABS-2 EA02EM
Time delay characteristics							
	Response time (off to on) 0→1	ms	0.05	0.05	0.05	10	10
	U _e max. ≤ 30 V I _e ≥ 5 mA (on/off) 1→0	ms	0.4	0.4	0.4	20	20
Maximum switching rate		Hz	1000	1000	1000	25	25
	50 % cyclic ratio						
	U _e ≤ 30 V I _e ≥ 5 mA						
Rated insulation voltage			Conforming to IEC 947-1 : 300 V				
			Conforming to VDE 0110 : 250 V group C				
Insulation test voltage for 1 min.							
	- input/output	kV rms	4				
	- wired interface/earth	kV rms	2.5				

■ See page 29.

Solid State Relay Interface Modules



Control Circuit Characteristics / Output Modules (at 131°/55°C ambient temperature)

Type of interface module		ABS-2 SC01EB	ABS-2 SC02EB	ABS-2 SA01MB	ABS-2 SA02MB
Rated voltage Us	VDC	24		24	
Maximum voltage	VDC	28.8		28.8	
Maximum current at Us	mA	12		13.6	
State 1 (on) guaranteed	VDC	16.9		16.9	
	mA	7.7		8.3	
State 0 (off) guaranteed	VDC	5.6		5.3	
	mA	2		2	
State 1 (on) display		yes		yes	
Internal protection against reverse polarity		yes		yes	

Output Circuit Characteristics

Rated operational voltage Ue	VDC/AC	5 to 48 VDC		5 to 48 VDC	24 to 240 VAC	24 to 240 VAC	
Maximum voltage	VDC/AC	57.6 VDC		57.6 VDC	264 VAC	264 VAC	
Maximum continuous current (Ith) ■ at 104°F/40 °C	A	2		3	2.3	3	
Rated operational current (Ie) Conforming to IEC 947-5-1 Single product/side-by-side at 55°C in vertical position	A	DC-12	1.5/0.9	2.5/2.2	AC-12	1.9/0.5	2.1/1.5
	A	DC-13	1.5/0.9	2.5/2.2	AC-13	1.6/0.5	1.6/1.5
	A	DC-14	0.6/0.6	0.6/0.6	AC-14	1.6/0.5	1.6/1.5
	A				AC-15	1/0.5	1/1
Minimum current	DC/AC	mA	1		10		
Maximum residual current	DC/AC	mA	1		2.5		
Maximum voltage drop	VDC/AC	1.5		3 (Ie ≥ 10 mA) 1.5 (Ie ≥ 100 mA)			
“0 crossing” voltage	VAC	-		50 peak			
Static dV/dt	V/μs	-		500			
Internal protection	BF	Against reverse polarity					
External protection		Against short-circuits for I _k ≤ 1 kA (AC) and ≤ 100 A (DC) Quick-blow fuse with very high breaking capacity : 3.15 A					

Other Characteristics

Maximum response time (off/on)0 →1 at Ie ≥ 10 mA (on/off)1 →0	ms	0.05			10 (50 Hz); 8 (60 Hz)		
	ms	0.6			10 (50 Hz) ; 8 (60 Hz)		
Maximum switching rate 55°C ; at Ie: single interface module 40% cyclic ratio	Hz	DC-13	6	6	AC-13	0.6	0.7
	Hz	DC-14	1	3	AC-14	0.6	0.7
	Hz				AC-15	0.6	0.7
On resistive load 50% cyclic ratio	Hz	700			50		
Rated insulation voltage		Conforming to IEC 947-1: 300 V AC Conforming to VDE 0110: 250 V group C					
Insulation test voltage For 1 min. - input/output - wired interface/earth	kV rms	4					
	kV rms	2.5					

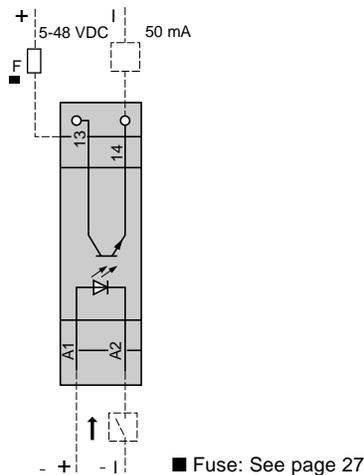
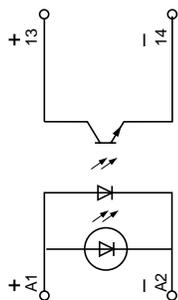
■ Refer to derating curves on page 25.



Wiring Diagrams

Solid state relay interface input modules

ABS-2EC●●●●



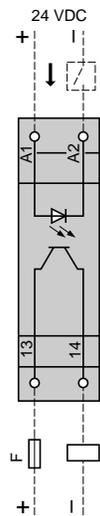
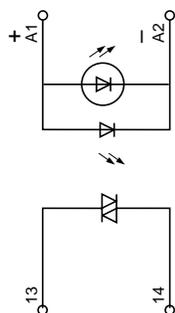
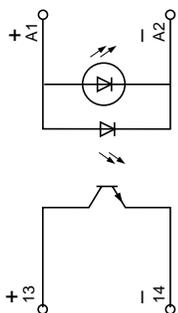
Solid state relay interface output modules

ABS-2SC0●EB

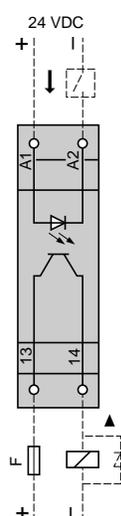
ABS-2SA0●MB

ABS-2SC0●EB

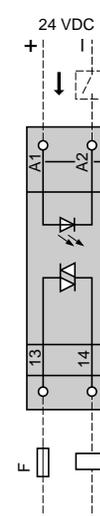
ABS-2SA0●MB



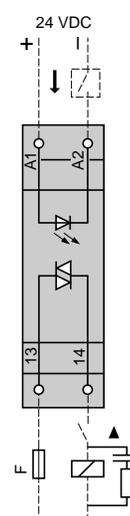
Resistive load



Inductive load



Resistive load



Inductive load

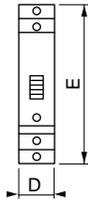
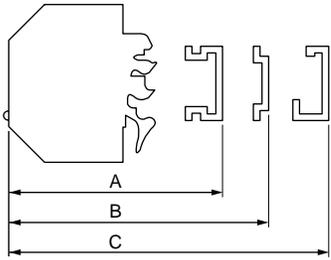
F : Quick blow fuse with very high breaking capacity: 3.15A
▲ or peak limiter

Solid State Relay Interface Modules



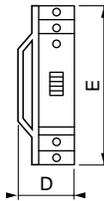
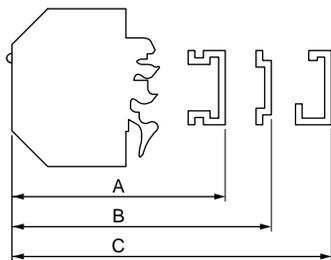
Dimensions

ABS-2E/ABS-2S●01●●



	Inches	mm
A	3.07	78.0
B	2.78	70.5
C	2.95	75.0
D	0.37	9.5
E	2.91	74.0

ABS-2S●02●●



	Inches	mm
A	3.07	78.0
B	2.78	70.5
C	2.95	75.0
D	0.69	17.5
E	2.91	74.0



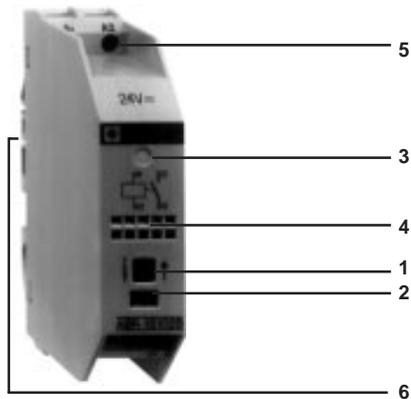
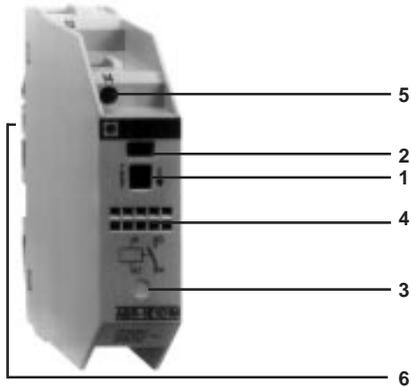
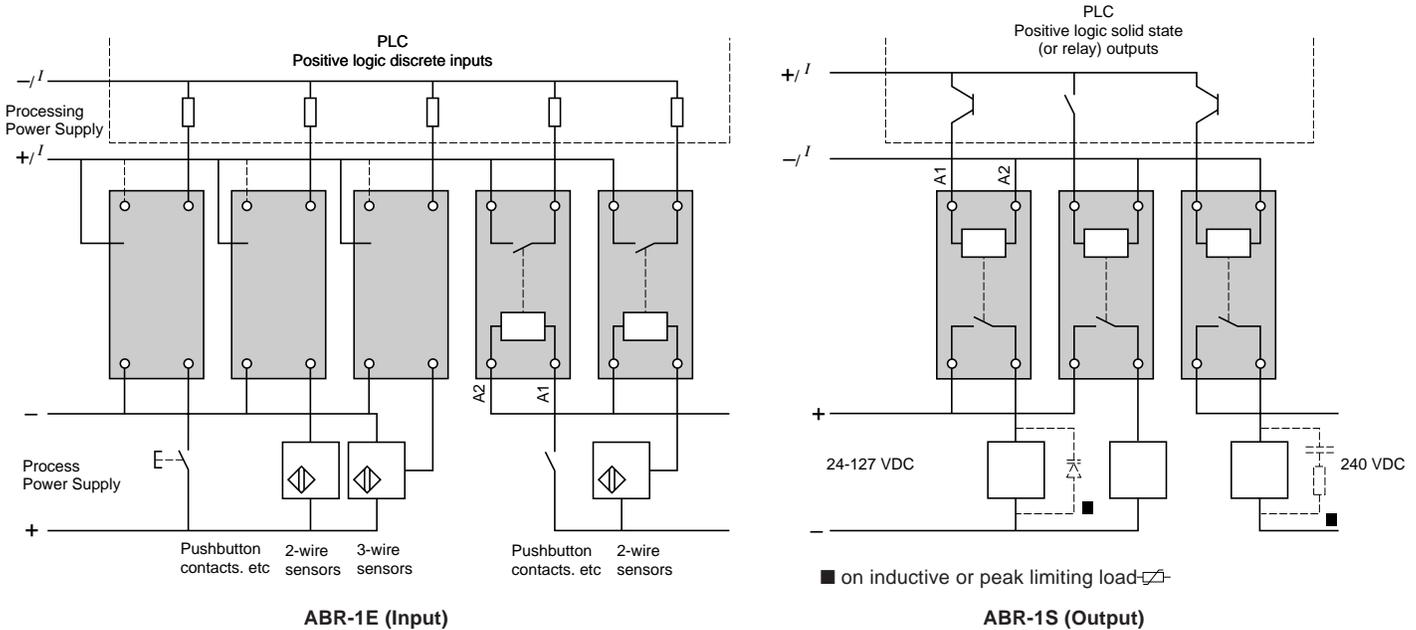
Notes



Electromechanical Relay Interface Modules



The ABR-1 electromechanical relay interface modules are designed for interfacing discrete digital input or output signals exchanged in automated equipment that comprise an automated system. Specifically, between a PLC and the field devices (I.E., contactors, solenoid valves, pilot lights, proximity sensors..).



- 1 Push button for manual operation of contacts during de-bug and troubleshooting.
- 2 Green indicator showing the mechanical state of contacts.
- 3 Green LED indicating the control signal state.
- 4 Location for 5 characters (number and/or letter) terminal identification. See page 49 for complete listing of available markers.

The ABR-1 range is comprised of two types:

Input Interfaces

Input interfaces are designed for switching input signals in processing units and are characterized by their high degree of contact reliability. The switching level is sufficiently high to ensure that the interfaces can directly control most contactors and indicator lamps.

Output Interfaces

Output interfaces are designed for the control of preactuators (contractors, solenoid valves, etc) for signalling devices (indicator lamps, audible warnings, etc).

- 5 The screw clamp terminals provide secure termination of one or two (stranded or solid) wires. The terminals are shipped backed out so that each terminal is ready to accept wires right out of the box, saving on installation time. Combination head screws are used to ease installation. All terminals are clearly marked to ease wiring.
- 6 Mounts on the common 35mm DIN 3 track or the DIN 1 track. See pages 47-48 for complete listing of available track.





Electromechanical Relay Input Interface Modules

Indicator	Contact Arrangement	Control circuit	Catalog No.	Standard Pack	Weight lb./kg
Mechanical ■	1 N/O	230/240 VAC	ABR-1E101M	1	.20/0.090
	1 C/O	230/240 VAC	ABR-1E301M	1	.20/0.090
Mechanical ■ + LED ▲	1 N/O	24 VAC/DC	ABR-1E118B	1	.21/0.095
		48 VAC/DC	ABR-1E118E	1	.21/0.095
		110-125 VDC ●	ABR-1E112F	1	.21/0.095
		110-127 VAC	ABR-1E111F	1	.21/0.095
		230/240 VAC	ABR-1E111M	1	.21/0.095
	2 N/O	24 VAC/DC	ABR-1E418B	1	.21/0.095
		48 VAC/DC	ABR-1E418E	1	.21/0.095
		110-125 VDC ●	ABR-1E412F	1	.21/0.095
		110-127 VAC	ABR-1E411F	1	.21/0.095
		230/240 VAC	ABR-1E411M	1	.21/0.095
	1 C/O	24 VAC/DC	ABR-1E318B	1	.21/0.095
		48 VAC/DC	ABR-1E318E	1	.21/0.095
	110-125 VDC ●	ABR-1E312F	1	.21/0.095	
	110-127 VAC	ABR-1E311F	1	.21/0.095	
	230/240 VAC	ABR-1E311M	1	.21/0.095	

Electromechanical Relay Output Interface Modules

Indicator	Contact Arrangement	Control circuit	Catalog No.	Standard Pack	Weight lb./kg
Mechanical ■	1 N/O	24 VDC	ABR-1S102B	1	.20/0.090
	2 N/O	24 VDC	ABR-1S402B	1	.20/0.090
	1 C/O	24 VDC	ABR-1S302B	1	.20/0.090
	1 N/C + 1 N/O	24 VDC	ABR-1S602B	1	.20/0.090
Mechanical ■ + LED ▲	1 N/O	24 VAC/DC	ABR-1S118B	1	.21/0.095
		48 VAC/DC	ABR-1S118E	1	.21/0.095
		110-127 VAC	ABR-1S111F	1	.21/0.095
	2 N/O	24 VAC/DC	ABR-1S418B	1	.21/0.095
		48 VAC/DC	ABR-1S418E	1	.21/0.095
		110-127 VAC	ABR-1S411F	1	.21/0.095
	1 C/O	24 VAC/DC	ABR-1S318B	1	.21/0.095
		48 VAC/DC	ABR-1S318E	1	.21/0.095
		110-127 VAC	ABR-1S311F	1	.21/0.095
	1 N/C + 1 N/O	24 VAC/DC	ABR-1S618B	1	.21/0.095
		48 VAC/DC	ABR-1S618E	1	.21/0.095
		110-127 VAC	ABR-1S611F	1	.21/0.095

- Green mechanical indicator for electrically or mechanically actuated contact(s).
- ▲ Green LED is "on" in the presence of a control signal.
- Polarised (+ on A1, - on A2).



Electromechanical Relay Interface Modules



Approvals	UL File E34281, CSA LR 81630-30 and IEC			—
Conforming to standards	IEC 947-5-1, IEC 255, UL 508			
Degree of protection	Conforming to IEC 529 (protection against direct contact)			IP 20B
Protective treatment				Tropical Climate
Flame resistance	Conforming to IEC 695-2-1	Incandescent wire		1562°F/850°C
		Conforming to UL 94		V0
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves 11 ms		50 g
Vibration resistance	Conforming to IEC 68-2-6	10-55 Hz		6 g
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 3	kV	8
Resistance to rapid transients	Conforming to IEC 801-4	On power supply	kV	2
		On I/O	kV	1
Resistance to shock waves	Conforming to IEC 255-4	Waveform 1.2/50 μ s ; 0.5 J	kV	2.5 (U > 50 V) ; 0.5 (U \leq 50 V)
Cross-sections which may be connected	Flexible cable with no cable end	1 or 2-wire		18 to 14 AWG/1 to 2.5 mm ²
		1-wire		20 to 14 AWG/0.5 to 2.5 mm ²
	Flexible cable with cable end	2-wire		20 to 16 AWG/0.5 to 1.5 mm ²
		Solid cable	1 or 2-wire	
Operating position	Any			
Ambient air temperature	Conforming to IEC 255	Operation		23 to 104°F/-5 to +40°C
		Permissible at Un		-4 to 140°F/-20 to +60°C
		Storage		-40 to 158°F/-40 to +70°C
Operating altitude			m	\leq 3000
Installation category	Conforming to IEC 947-1			II
Degree of pollution	Conforming to IEC 947-5-1			3
Mounting	Standard rails	see pages 47-48		



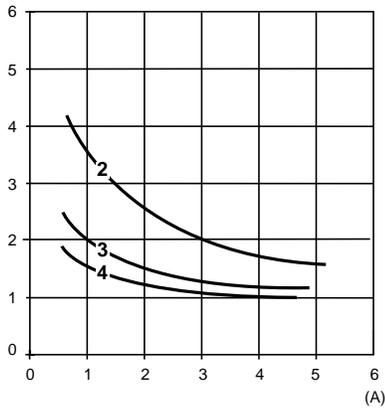
Electrical Durability of Contacts

Test conditions :

In accordance with standard IEC 947-5-1 set up for rated control voltage, operating rate : 1800 cycles/hour.

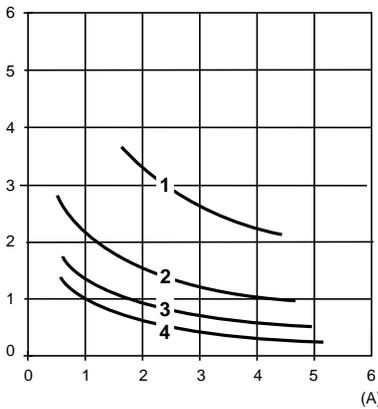
AC loads

Operating cycles in millions



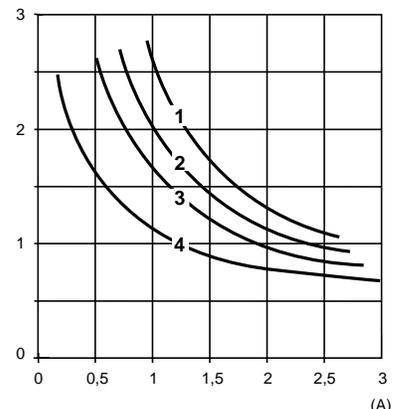
AC-12 : control of resistive loads and isolated solid state loads via optocoupler
 $\cos \varphi \geq 0.9$

Operating cycles in millions



AC-13 : control of isolated solid state loads via transformer
 $\cos \varphi \geq 0.65$

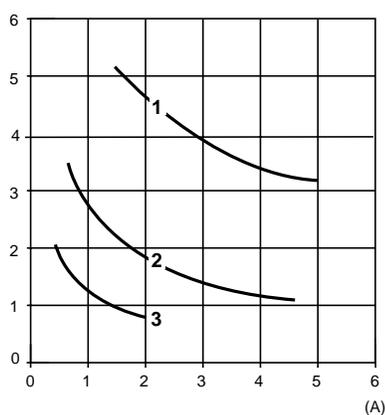
Operating cycles in millions



AC-14 : control of weak electro-magnetic loads for electro-magnets ≤ 72 VA
 make : $\cos \varphi = 0.3$
 break : $\cos \varphi = 0.3$
 AC-15 : control of electro-magnetic loads of electro-magnets > 72 VA
 make : $\cos \varphi = 0.7$
 break : $\cos \varphi = 0.4$

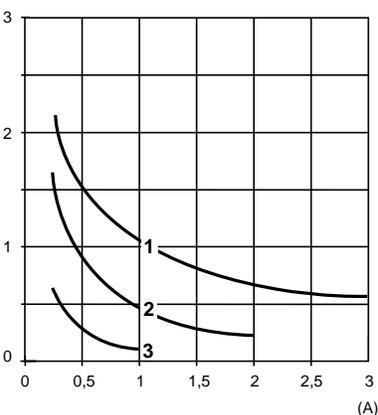
DC loads

Operating cycles in millions



DC-12 : control of resistive loads and isolated solid state loads via optocoupler
 $L/R \leq 1$ ms
 1 24 VAC/DC
 2 48 VAC/DC
 3 127 VAC/DC
 4 230 VAC/DC

Operating cycles in millions



DC-13 : control of electro-magnets
 $L/R \leq 2 \times (U_e \times I_e)$ in ms.
 U_e : rated operating voltage
 I_e : rated operating current



Electromechanical Relay Interface Modules



Control Circuit Characteristics Input Modules

Type of interface		ABR-1E118B ABR-1E418B ABR-1E318B	ABR-1E118E ABR-1E418E ABR-1E318E	ABR-1E112F ABR-1E412F ABR-1E312F	ABR-1E111F ABR-1E411F ABR-1E311F	ABR-1E101M ABR-1E301M	ABR-1E111M ABR-1E411M ABR-1E311M	
Rated voltage (Un)	V	24 VAC/DC	48 VAC/DC	110 -125 VDC	110 -127 VAC	230 - 240 VAC	230 - 240 VAC	
Permissible voltage variation	V	17 to 30	38 to 53	97 to 137	93 to 140	195 to 255	195 to 255	
Current frequency	Hz	50/60	50/60	–	50/60	50/60	50/60	
Maximum drop-out voltage 74°F/40°C		> 0.1 Un	> 0.1 Un	> 0.1 Un	> 0.2 Un	> 0.2 Un	> 0.2 Un	
Rated current	VAC/DC	mA	62/55	36/32	15	8	7	5.5
Minimum maintaining current	VAC/DC	mA	4.9/5.2	4.7/5.4	1.5	2.4	2	1.5
Dissipated power	W	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	
Disappearance of voltage maximum time up to which contact is maintained	ms	10/10	14/10	17	6	5	6	
Display of control circuit by LED		yes	yes	yes	yes	no	yes	
Built-in protection reversed polarity		yes	yes	yes	not applicable	not applicable	not applicable	

Contact Characteristics

Type of interface			ABR-1E Input Module
Rated operating voltage Ue	Conforming to IEC 947-5-1 up to	VAC	250
		VDC	125
UL Contact Rating			NEMA D150
Operating current frequency		Hz	50/60
Thermal current Ith	Conforming to IEC 947-1	A	2
Minimum switching capacity		mVA	50
		V	U min: 17
		mA	I min: 3
Protection against short-circuits	For I _k ≤ 2.5 kA Type and value of recommended fuse	A	Quick-blow fuse with high breaking capacity 16

Other Characteristics

Operating time at Un and at 68°F/20°C	Between energization of coil and closing of N/O contact	ms	≤ 12
	Between energization of coil and opening of N/C contact	ms	≤ 12
	Between de-energization of coil and closing of N/O contact	ms	≤ 12
	Between de-energization of coil and closing of N/C contact	ms	≤ 12
Duration of bounce		ms	≤ 3
Contact bridging times between N/C and N/O contact	Maximum make before break or break before make time	ms	1
Maximum operating rate		Hz	6 operating cycles
Durability at Un in millions of operating cycles	ABR-1 (1 N/O or 2 N/O)		≥ 20 million
	ABR-1 (1 C/O or 1 N/C + 1 N/O)		≥ 10 million
Rated insulation voltage	Conforming to IEC 947-1	VAC	250
	Conforming to VDE 0110 group C	VAC	250
Test insulation voltage for 1 min	Coil circuit/contact circuits	kV rms	4
	Wired interface/earth	kV rms	2.5
	Between independent contacts 2 N/O and 1 N/C + 1 N/O	kV rms	1.5



Control Circuit Characteristics Output Modules

Type of interface		ABR-1S102B ABR-1S402B ABR-1S302B ABR-1S602B	ABR-1S118B ABR-1S418B ABR-1S318B ABR-1S618B	ABR-1S118E ABR-1S418E ABR-1S318E ABR-1S618E	ABR-1S111F ABR-1S411F ABR-1S311F ABR-1S611F	
Rated voltage (Un)	V	24 VDC	24 VAC/DC	48 VAC/DC	110 -127 VAC	
Permissible voltage variation	V	17 to 30	17 to 30	38 to 53	93 to 140	
Current frequency	Hz	–	50/60	50/60	50/60	
Maximum drop-out voltage 104°F/40°C		> 0.1 Un	> 0.1 Un	> 0.1 Un	> 0.2 Un	
Rated current	VAC/DC	mA	62	62/55	38/32	8
Minimum maintaining current	VAC/DC	mA	4.9/5.2	4.9/5.2	4.7/5.4	2.4
Dissipated power	W	≤ 1	≤ 1	≤ 1	≤ 1	
Disappearance of voltage maximum time up to which contact is maintained	ms	3	10/10	14/10	6	
Display of control circuit by LED		no	yes	yes	yes	
Built-in protection reversed polarity		yes	yes	yes	not applicable	

Contact Characteristics

Type of interface			ABR-1 Output Module
Rated operating voltage Ue	Conforming to IEC 947-5-1 up to	VAC VDC	250 125
UL Contact Rating			NEMA D150
Operating current frequency		Hz	50/60
Thermal current Ith	Conforming to IEC 947-1	A	12
Rated operating current (Ie) per 1 million operating cycles	Conforming to IEC 947-5-1 Ue : 230 VAC	A	AC-12:4 AC-13:1 AC-14:1 AC-15:1
	Conforming to IEC 947-5-1 Ue : 24 VDC	A	DC-12:5 DC-13:1
Minimum switching capacity		V mA	U min : 17 I min : 10
Protection against short-circuits	For Ik ≤ 2.5 kA Type and value of recommended fuse	A	Quick-blow fuse with high breaking capacity 16

Other Characteristics

Operating time at Un and at 68°F/20°C	Between energization of coil and closing of N/O contact	ms	≤ 12
	Between energization of coil and opening of N/C contact	ms	≤ 12
	Between de-energization of coil and closing of N/O contact	ms	≤ 12
	Between de-energization of coil and closing of N/C contact	ms	≤ 12
Duration of bounce		ms	≤ 3
Contact bridging times between N/C and N/O contact	Maximum make before break or break before make time	ms	1
Maximum operating rate		Hz	6 operating cycles
Durability at Un in millions of operating cycles	ABR-1 (1 N/O or 2 N/O)		≥ 20 million
	ABR-1 (1 C/O or 1 N/C + 1 N/O)		≥ 10 million
Rated insulation voltage	Conforming to IEC 947-1	VAC	250
	Conforming to VDE 0110 group C	VAC	250
Test insulation voltage for 1 min	Coil circuit/contact circuits	kV rms	4
	Wired interface/earth	kV rms	2.5
	Between independent contacts 2 N/O and 1 N/C + 1 N/O	kV rms	1.5

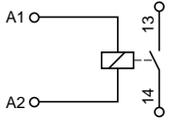
Electromechanical Relay Interface Modules



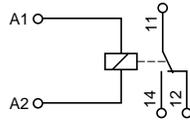
Wiring Diagrams

24 VDC or 230 VAC interfaces with mechanical indication

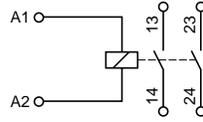
1 N/O



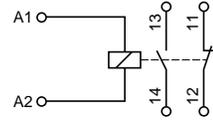
1 C/O



2 N/O

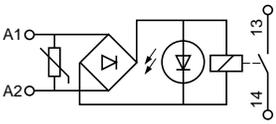


1 N/C + 1 N/O

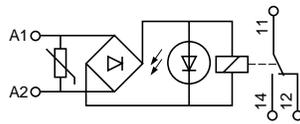


24 V AC/DC or 48 V AC/DC interfaces with mechanical indication + LED

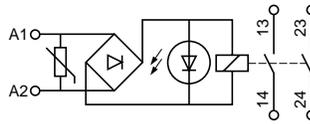
1 N/O



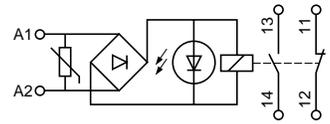
1 C/O



2 N/O

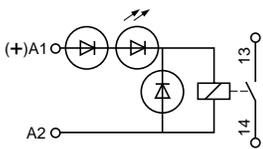


1 N/C + 1 N/O

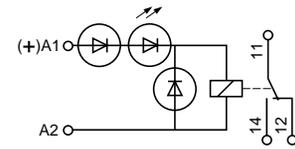


110 V AC/DC or 230 V AC/DC interfaces with mechanical indication + LED

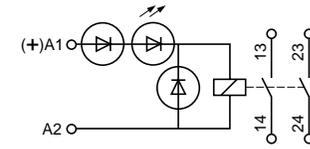
1 N/O



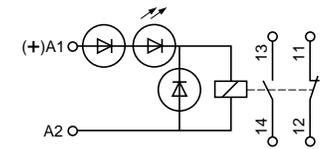
1 C/O



2 N/O

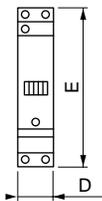
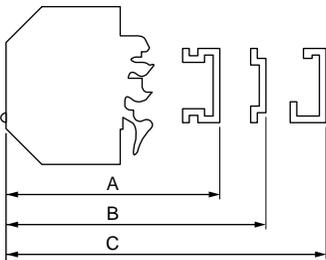


1 N/C + 1 N/O



Dimensions

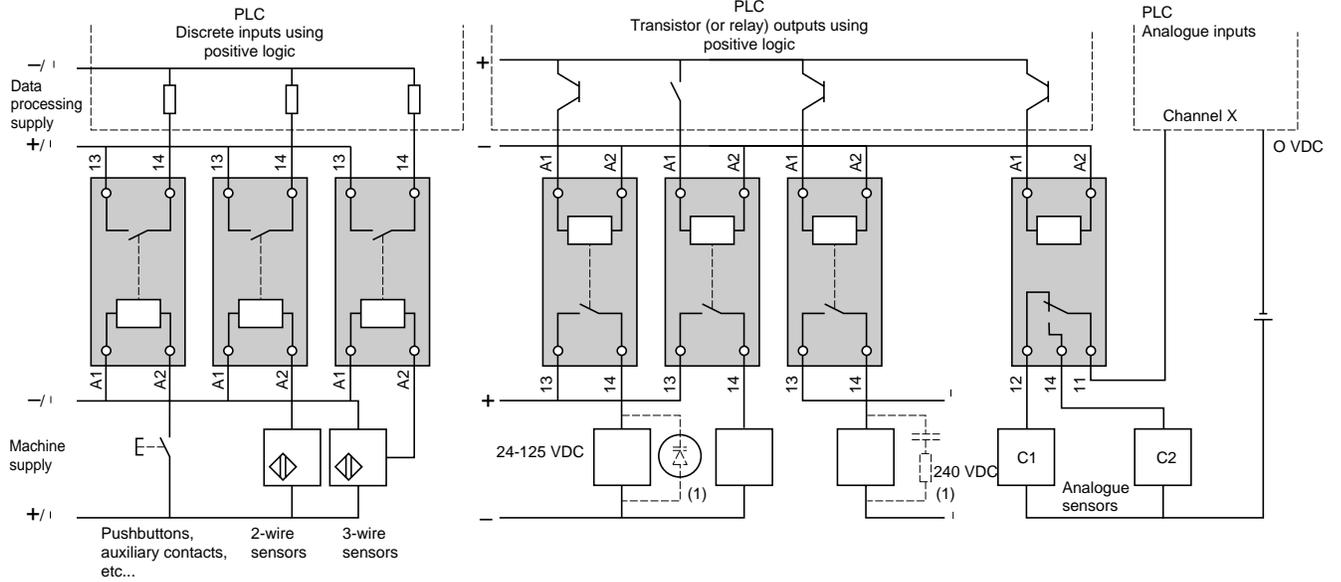
ABR-1



	Inches	mm
A	3.07	78.0
B	2.78	70.5
C	2.95	75.0
D	0.69	17.5
E	2.91	74.0



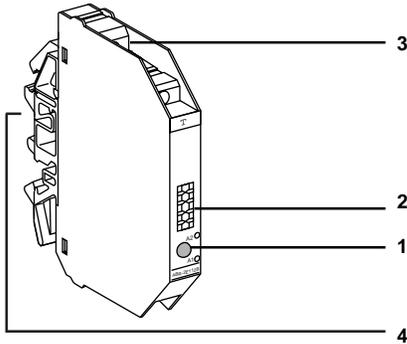
The ABR-2 relay interface modules are designed for interfacing discrete digital input or output signals exchanged in automated equipment that comprise an automated system. Specifically, between a PLC and a field device (contactors, solenoid valves, pilot lights, proximity sensors etc). The ABR-2 products are more compact relative to the ABR-1 products due to the micro relay technology incorporated in the design.



ABR-2E (Input)

ABR-2S (Output)

Electromechanical Relay Interface Modules

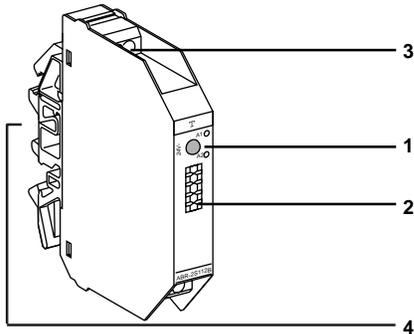


The ABR-2 range is comprised of 2 types:

Input interface modules (9.5 mm)

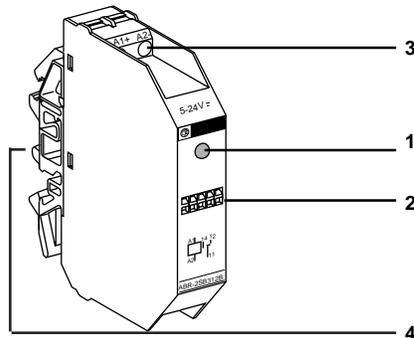
The input interface modules were designed for switching data processing unit input signals and are characterized by very high contact reliability.

They have guaranteed immunity to leakage currents ≤ 2 mA, and a wide coil range (0.7 to 1.25 U_n). This enables use with two-wire sensors.



Output interface modules (12 mm)

The output interface modules were designed for the control of preactuators (contactors, solenoid valves etc.) as well as signaling units (pilot lights, audible alarms etc.) and are characterized by a high switching capacity and guaranteed immunity to leakage currents ≤ 2 mA. A low-cost version without signalling LED is available.



Input and output interface modules (17.5 mm) for very low switching levels.

In 1 C/O contact version, these interface modules are suitable for switching logic (TTL or HCMOS).

Caution : Never use this type of interface to switch inductive loads.

- 1 Green LED indicating the control signal state.
- 2 Location for 5 characters (number and/or letter) terminal identification. See page 49 for complete listing of available markers
- 3 The screw clamp terminals provide secure termination of one or two (stranded or solid) wires. The terminals are shipped backed out so that each terminal is ready to accept wires right out of the box, saving on installation time. Combination head screws are used to ease installation. All terminals are clearly marked to ease wiring.
- 4 Mounts on the common 35mm DIN 3 track or the DIN 1 track. See pages 47-48 for complete listing of available track.





Electromechanical Relay Input Interface Modules (width 9.5 mm)

Indicator	Composition	Control circuit	Catalog No.	Standard Pack	Weight lb./kg
With LED	1 N/O	24 VDC	ABR-2E112B	1	.07/0.032
		48 VDC	ABR-2E112E	1	.07/0.032
		120-127 VAC (60 Hz)	ABR-2E116F	1	.08/0.035
		230-240 VAC (50/60 Hz)	ABR-2E111M	1	.08/0.036

Electromechanical Relay Output Interface Modules (width 12 mm)

Indicator	Composition	Control circuit	Catalog No.	Standard Pack	Weight lb./kg
Without LED	1 N/O	24 VDC	ABR-2S102B	1	.08/0.040
With LED	1 N/O	24 VDC	ABR-2S112B	1	.09/0.041

Interface Modules for Very Low Level Switching (width 17.5 mm)

Indicator	Function	Composition	Control circuit	Catalog No.	Standard Pack	Weight lb./kg
With LED	Input	1 C/O	24 VDC	ABR-2EB312B ■	1	.11/0.048
	Output	1 C/O	24 VDC	ABR-2SB312B ■	1	.11/0.048

■ Do not use to switch inductive loads.



Electromechanical Relay Interface Modules



Approvals	UL File E34281, CSA LR 81630-38 and IEC		
Conformity to standards	IEC 947-5-1, UL 508		
Degree of protection	Conforming to IEC 529 (protection against direct contact)		IP20B
Protective treatment	Tropical Climate 1730°F/960°C		
Fire resistance	Conforming to IEC 695-2-1	Incandescent wire	°C 960
Shock resistance	Conforming to IEC 68-2-27	Conforming to UL 94	VO
		11 ms half sine waves	gn 30
Vibration resistance	Conforming to IEC 68-2-6	10-150 Hz	gn 3
Withstand to electrostatic discharges	Conforming to IEC 801-2	Level 3	kV 8
Immunity to radiated fields	Conforming to IEC 801-3	Level 3; 27-1000 MHz	V/m 10
Immunity to fast interference	Conforming to IEC 801-4	On supply	kV 2
	Level 3	On input/output	kV 1
Impulse withstand voltage	Conforming to IEC 947-1	1.2/50 µs wave ; 0.5 J U < 50 V	kV 0.5
		U < 150 V	kV 1.5
		U < 300 V	kV 2.5
Cable capacity	Flexible cable without cable end	1 or 2 conductors	20 to 14 AWG/0.6 to 2.5 mm ²
	Flexible cable without cable end	1 or 2 conductors	22 to 14 AWG/0.34 to 2.5 mm ²
	Rigid cable	1 conductor	24 to 12 AWG/0.27 to 4 mm ²
Operating position	All		
Ambient air temperature	For operation without restriction		23 to 104°F/-5 to 40°C
	For operation at 0.85 to 1.1 of Us		23 to 131°F/-5 to 55°C
	For operation with restriction at Us		-13 to 158°F/-25 to +70°C ●
	For storage		-40 to +176°F/-40 to +80°C ●
Operating altitude			m ≤ 3000
Installation category	Conforming to IEC 947-1		II
Degree of pollution	Conforming to IEC 947-1		2
Mounting	Standard mounting rails	see pages 47-48	

● 8 mm spacing between ABR-2S1●●● at ambient temperature ≥ 131°F/ 55°C.



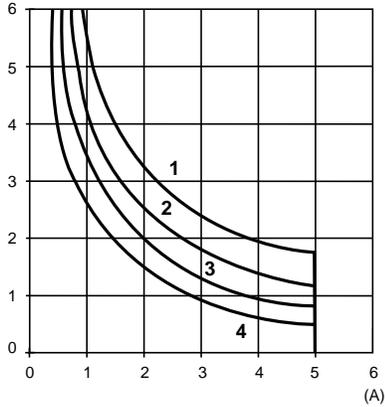
Electrical Durability (ABR-2S)

Test conditions :

Conforming to standard IEC 947-5-1 established for the rated control voltage.

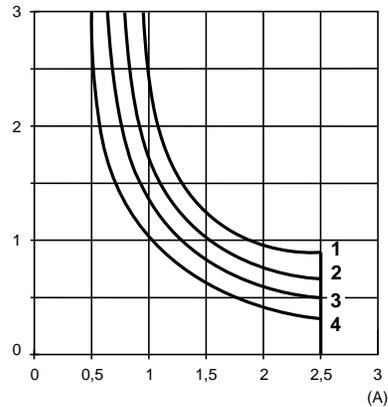
AC supplied loads

Millions of operating cycles



AC-12 : control of resistive loads and of solid state loads isolated by photocoupler
 $\cos \varphi \geq 0.9$

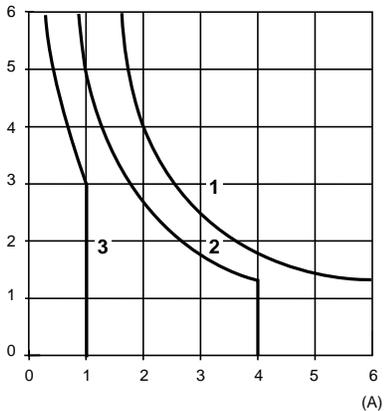
Millions of operating cycles



AC-14 : control of small electromagnetic loads of electromagnets ≤ 72 VA
 making : $\cos \varphi = 0.3$
 breaking : $\cos \varphi = 0.3$
 AC-15 : control of electromagnetic loads of electromagnets > 72 VA
 making : $\cos \varphi = 0.7$
 breaking : $\cos \varphi = 0.4$

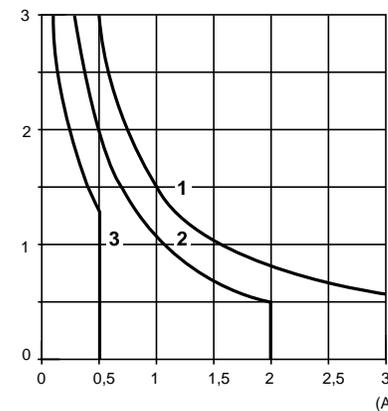
DC supplied loads

Millions of operating cycles



DC-12 : control of resistive loads and of solid state loads isolated by photocoupler
 $L/R \leq 1$ ms

Millions of operating cycles



DC-13 : control of electromagnets
 $L/R \leq 2 \times (U_e \times I_e)$ in ms.
 U_e : rated operational voltage
 I_e : rated operational current
 (with protective diode across the load)

- 1 24 VAC/DC
- 2 48 VAC/DC
- 3 115 VAC/DC
- 4 230 VAC



Electromechanical Relay Interface Modules



Control Circuit Characteristics

Type of interface module		ABR-2E112B	ABR-2E112E	ABR-2E116F	ABR-2E111M	ABR-2S112B	ABR-2S102B	ABR-2EB312B	ABR-2SB312B ■
Rated voltage (Us)	V	24V DC	48 VDC	120/127VAC	230/240VAC	24 VDC	24 VDC	24 VDC	24 VDC
Frequency	Hz			60	50/60				
Switching threshold	V	16.9 VDC	37.3 VDC	97 VAC	186 VAC	16.9 VDC	14.5 VDC	16.9 VDC	16.9 VDC
Maximum operating voltage	V	28.8VDC	57.6 VDC	140 VAC	264 VAC	28.8 VDC	28.8 VDC	28.8 VDC	28.8 VDC
Maximum drop out voltage (Un) at 140°F (40°C)	V	3.8 VDC	8.5 VDC	25.4 VAC	48 VAC	3.8 VDC	2 VDC	3.8 VDC	3.8 VDC
Maximum current (at Us)	mA	19.5	11	16	15	28	18	23	23
Minimum sealed current	mA	2	2	2.5	2.5	2	1.3	2	2
Max. power dissipated at Us	W								
50 Hz		0.45	0.52	0.73	0.77	0.54	0.43	0.55	0.55
60Hz						0.64			
Loss of voltage maximum time not affecting operation	ms	1	1	10	10	5	5	1	1
Control circuit indication by LED		yes	yes	yes	yes	yes	no	yes	yes
Internal protection against reverse polarity		yes	yes	-	-	yes	yes	yes	yes

Contact Characteristics

Type of interface module		ABR-2E112B ABR-2E112E ABR-2E116F ABR-2E111M	ABR-2S112B	ABR-2S102B	ABR-2EB312B ABR-2SB312B
Contact composition		1 N/O	1 N/O	1 N/O	1 C/O ■
Maximum rated operational voltage (max. Ue)	Conforming to IEC 947-5-1	VAC 115 VDC 100	230 120	230 120	48 48
Maximum switching voltage		VAC 125 VDC 125	250 150	250 150	60 60
Operational frequency		Hz 50/60	50/60	50/60	50/60
Thermal overload current (Ith)	Conforming to IEC 947-1	A 1	5	5	0.05
Rated operational current (Ie) for 1 million operating cycles	Conforming to IEC 947-5-1 max. Ue	AC12 A 1 AC14 A 0.5 AC15 A 0.5	3 1 1	3 1 1	- - -
	Conforming to IEC 947-5-1 Ue : 24 V DC	DC12 A	1	1.7	1.7
UL Contact Rating	NEMA D150	DC13 A	1.5	1.5	-
Minimum switching current		mA 1	5	5	0.01
Minimum switching voltage		V 5	5	5	0.01
Protection against short-circuits	For I _k ≤ 1 kA (AC) and ≤ 100 A (DC) Recommended fuse type and rating	Quick-blow fuse with high breaking capacity			
Low level contact reliability (17 V, 5 mA)	Number of failures for "n" million operating cycles	A 2	6.3	6.3	0.4
		1 for 100 million			

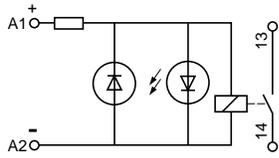
Other Characteristics

Maximum operating time at Us (including bounce)	Between energizing coil and N/O contact closing	DC	ms	10	10	10	6
		AC	ms	30			
	Between energizing coil and N/C contact opening		ms				6
	Between de-energizing coil and N/O contact opening	DC	ms	6	12	5	6
		AC	ms	30			
	Between de-energizing coil and N/C contact closing		ms				6
Maximum bounce duration			ms	5	5	5	2
'Break before make' guaranteed between N/C and N/O contacts	Maximum 'break before make' time	on energizing	ms				5
		on de-energizing	ms				2
Maximum operating rate		off load	Hz	10	10	10	10
		at Ie	Hz	0.5	0.5	0.5	
Mechanical durability in millions of operating cycles				20	10	10	20
Rated insulation voltage	Conforming to IEC 947-1		VAC	300			
	Conforming to VDE 0110 group C		VAC	250			
Insulation test voltage for 1 min.	Coil circuit/contact circuit		kV rms	2	4	4	1.5
	Wired interface/earth		kV rms	2.5	2.5	2.5	2.5
	Between open contacts		kV rms	0.75	1	1	1

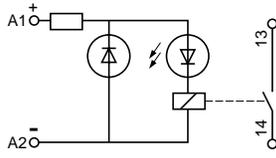
■ Do not use to switch inductive loads



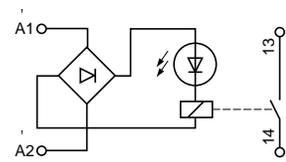
ABR-2E112B (24 VDC)



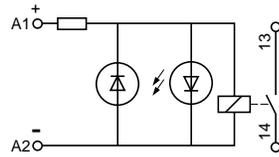
ABR-2E112E (48 VDC)



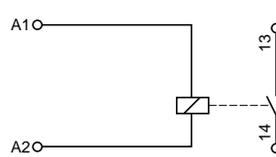
ABR-2E11●F/M (115-230 VAC)



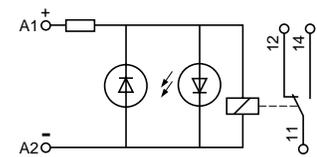
ABR-2S112B (24 VDC)



ABR-2S102B (24 VDC)



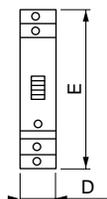
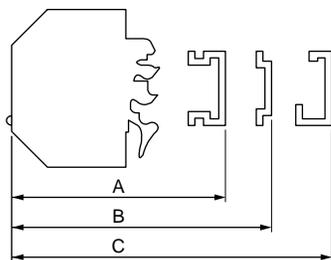
ABR-2●B312B (24 VDC)



Electromechanical Relay Interface Modules

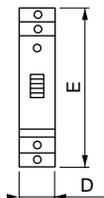
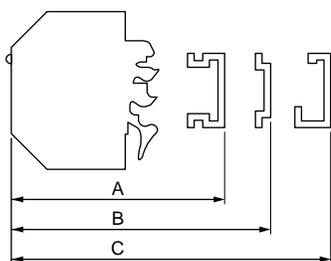


ABR-2E●●●●



	Inches	mm
A	3.07	78.0
B	2.78	70.5
C	2.95	75.0
D	0.37	9.50
E	2.91	74.0

ABR-2S1●●●

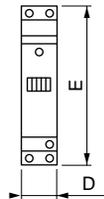
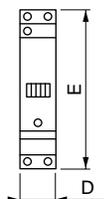
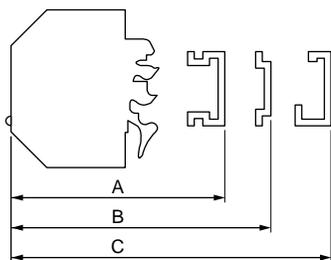


	Inches	mm
A	3.07	78.0
B	2.78	70.5
C	2.95	75.0
D	0.47	12.0
E	2.91	74.0

ABR-2●B312B

ABR-2EB312B

ABR-2SB312B



	Inches	mm
A	3.07	78.0
B	2.78	70.5
C	2.95	75.0
D	0.69	17.5
E	2.91	74.0



Interface Module DIN Track Accessories



AM1-ED200



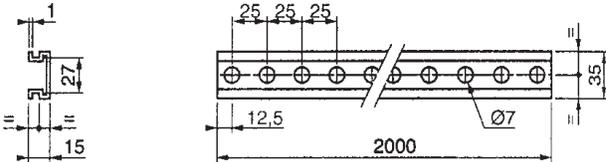
AM1-DE200



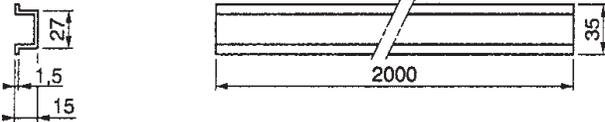
AM1-DP200

Description	Length	Catalog No.	Standard Pack
15 mm depth 1 mm steel, zinc chromated	2 m 78.74"	AM1-ED200	10
15 mm depth 1.5 mm steel, zinc chromated	2 m 78.74"	AM1-DE200	10
7.5 mm depth 1 mm steel, zinc chromated	2 m 78.74"	AM1-DP200	10

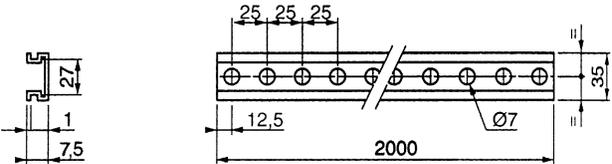
AM1-ED200



AM1-DE200



AM1-DP200





9080 MH2xx



9080 MH3xx



DIN 3



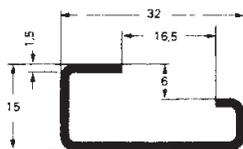
9080 MHA10



9999 NT-13



9080 MH1xx



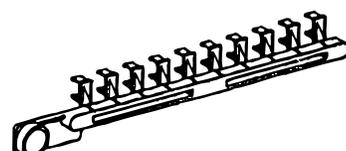
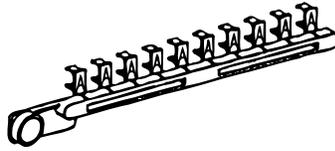
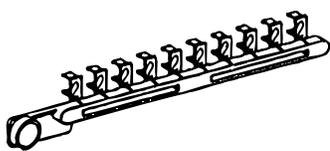
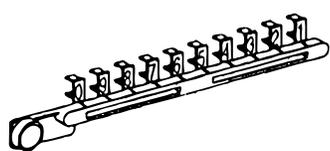
DIN 1

Description	Length	Catalog No.	Standard Pack
Galvanized steel (no mounting holes)	.5 19.68"	9080 MH220 19.68"	10
Galvanized steel (no mounting holes)	1 m 39.37"	9080 MH239	10
Galvanized steel (no mounting holes)	2 m 78.74"	9080 MH279	10
Bichromated zinc steel, prepunched	.5 19.68"	9080 MH320	10
Bichromated zinc steel, prepunched	1 m 39.37"	9080 MH339	10
Bichromated zinc steel, prepunched	2 m 78.74"	9080 MH379	10
End clamp for DIN 3 track		9080 MHA10	50
DIN Mounting track A 1 meter section of 35 mm Al DIN track	1 m 39.37"	9999 NT13	10
Asymmetrical 32mm (1.26") G Rail in compliance with EN50035 standard (DIN 46277-1)	.5m 1 m 39.37"	9080 MH120 19.68" 9080 MH139	8 8
Bichromated zinc steel (no mounting holes)	2 m 78.74"	9080 MH179	8



Clip-in Marker Strips ▲

10 identical numbers (or symbols)	10 numbers 0 to 9	10 identical letters	
AB1-R**	AB1-R11	AB1-G*	AB1-G*

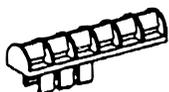


Sold in lots of 25 identical strips Unit weight: 2g	Sold in lots of 25 identical strips Unit weight: 2g	Sold in lots of 25 identical strips Unit weight: 2g	Sold in lots of 25 identical strips Unit weight: 2g
--	--	--	--

Marking	Reference of 10-number tag strip						
Blank	AB1-RV	0-9	AB1-R11	A	AB1-GA	N	AB1-GN
1	AB1-R1			B	AB1-GB	O	AB1-GO
2	AB1-R2			C	AB1-GC	P	AB1-GP
3	AB1-R3			D	AB1-GD	Q	AB1-GQ
4	AB1-R4			E	AB1-GE	R	AB1-GR
5	AB1-R5			F	AB1-GF	S	AB1-GS
6	AB1-R6			G	AB1-GG	T	AB1-GT
7	AB1-R7			H	AB1-GH	U	AB1-GU
8	AB1-R8			I	AB1-GI	V	AB1-GV
9	AB1-R9			J	AB1-GJ	W	AB1-GW
0	AB1-R0			K	AB1-GK	X	AB1-GX
+	AB1-R12			L	AB1-GL	Y	AB1-GY
-	AB1-R13			M	AB1-GM	Z	AB1-GZ

Marking Components

Holder for 6 markers	Blank clip-in marker	Clip-in marker with earth symbol ■
AB1-SR6	AB1-SA*	AB1-RT



Sold in lots of 200	Sold in lots of 500	Sold in lots of 500
Unit weight: 0.6 g	Unit weight: 0.3 g (AB1-SA1,SA2) 0.4 g (AB1-SA3)	Unit weight: 0.3 g
	Size Unit	Size Unit
	mm reference	mm reference
Holder for up to 6 AB1-R or G markers	4.5x8.3 AB1-SA1	4.5x8.3 AB1-RT
	4.5x14 AB1-SA2	
	4.5x19 AB1-SA3	

▲ Can also be used on other Telemecanique products such as GV1 thermal-magnetic circuit breakers, modular contractors, "D" range contactors, "E" range contactors, etc.
 ■ Black on white background

Notes



Notes



Notes





SQUARE D

From single products to complete systems, look to Square D.

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Square D Company is part of Groupe Schneider, an \$11 billion global manufacturer of electrical distribution, automation and industrial equipment.

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