Interfaces
For analogue signals

Type	Transmitters				
					
Functions	For Pt 100 probes			Voltage/current	
Width (mm)	22.5		29	16.5	22.5
Characteristics	2-wire connection	3-wire connection	4-wire connection	Non insulated	Triple insulated
Input signal	Temperature 0…100 °C 0…500 °C	Temperature - 100… + 100 °C - 40… + 100 °C 0…100 °C 0…200 °C 0…500 °C	Temperature - 100… + 100 °C 0…100 °C 0…500 °C	0…10 V 0…20 mA 4…20 mA	± 10 V 0…10 V 0…20 mA 4…20 mA
Output signal	0…10 V 0…20 mA 4…20 mA			0…10 V 0…20 mA 4…20 mA	± 10 V 0…10 V 0…20 mA 4…20 mA
Cabling	Screw terminals				
References	ABA-6PT2	ABA-6PT3	ABA-6PT4	ABA-6TAppA	ABA-6TAppB
Page	14005/2			14006/2	

Converters		Threshold detection		Reference sources
				
Analogue/digital	Digital/analogue	Relay output	Solid state output	For potentiometer
				16.5
–		With or without LCD display		–
0…10 V 0…20 mA 4…20 mA	8 bit 12 bit	0…10 V 0…20 mA		Supply c 15…30 V / Supply c 24 V
8 bit / 12 bit	0…10 V ±10 V 0…20 mA	Solid state discrete output (transistor)	1 N/O relay discrete output	Voltage c 10 V / Voltage c 10 V and current 20 mA
HE 10-14 pin connector Screw terminals		Screw terminals		
ABA-6AD8p / ABA-6AD12p	ABA-6DA8p / ABA-6DA12p	ABA-6SAppS	ABA-6SAppR	ABA-6LP01 / ABA-6LP12
14007/2	14008/2	14009/2		14010/2

Interfaces

For analogue signals
Transmitters for Pt 100 probes

ABA-6PT transmitters for Pt 100 probes are in the form of compact modules, and are available in 2 widths, 22.5 and 29 mm.

They are designed for interfacing Pt 100 type temperature measurement probes, whose resistance varies with the temperature. The characteristics of these probes are defined in standards DIN 43760 and IEC 751.

The transmitters supply power to the probes, process the signal and produce a standard signal (voltage or current) which can be transmitted remotely and used by a processor (PLC ; computer ; measurement station ; regulator, etc).

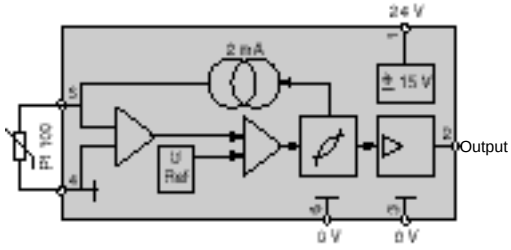
The ABA-6PT range covers 5 temperature ranges ± 100 °C ; -40 + 40 °C ; 0-100 °C ; 0-200 °C ; 0-500 °C.

Composition

The ABA-6PT range comprises 3 families :

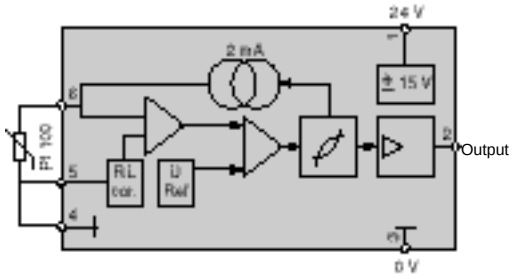
2-wire measurement transmitters

These ABA-6PT2 interfaces are designed for applications where the distance between the probe and the interface is very short (2 to 3 m maximum) and where very precise measurement is not required.



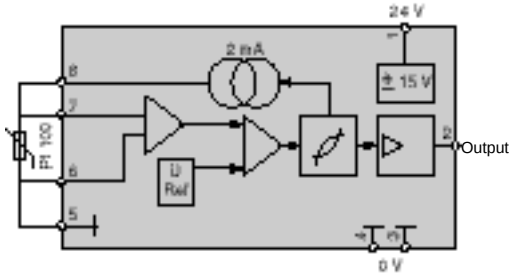
3-wire measurement transmitters

These ABA-6PT3 interfaces are designed for applications where the distance between the probe and the interface is greater and precise measurement is required.
The interface corrects measurement errors introduced by the resistance of the cables connecting the probe.



4-wire transmitters

These ABA-6PT4 interfaces are designed for applications where there is a considerable distance between the probe and the interface, and precise measurement is required : the 4-wire design eliminates measurement errors caused by the resistance of the cables connecting the probe.



Characteristics : page 14005/3
Compatibility : page 14005/4
References : page 14005/5
Dimensions : page 14005/5

Interfaces

For analogue signals
Transmitters for Pt 100 probes

Environment

Conforming to standards	IEC 947-1; VDE 0110 b			
Degree of protection	Conforming to IEC 529 (Protection against direct contact)			IP 20
Protective treatment				"TC"
Flame resistance	Conforming to IEC 695-2-1	Incandescent wire	**°C**	850
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves 11 ms	**gn**	50
Vibration resistance	Conforming to IEC 68-2-6	10…55 Hz	**gn**	5
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 3	**kV**	8
Resistance to rapid transients	Conforming to IEC 801-4 Level 3	On power 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	**mm²**	0.5…2.5
	Flexible cable with cable end	1-wire	**mm²**	0.22…2.5
		2-wire	**mm²**	≤ 1.5
	Rigid cable	1-wire	**mm²**	0.5…4
Operating position	Any			
Ambient air temperature around the device	Operation	Mounted vertically, touching	**°C**	0…50
		Devices 2 cm apart	**°C**	0…60
	Storage		**°C**	– 40…+ 85
Insulation voltage	Terminals/fixing rails		**kV**	2
Installation category	Conforming to IEC 947-1			II
Degree of pollution	Conforming to IEC 947-1			2
Safety	If input cut or short-circuited		–	
Mounting	Standard rails	7 1 4		

Special characteristics

Power supply		Supply voltage	**V**	24 ± 20 % including ripple
		Maximum voltage without damage	**V**	± 30
		Maximum current	**mA**	20 (voltage output)
			mA	32 (current voltage)
		Built-in protection		Reversed polarity
Input		Type of probe		Conforming to standards IEC 751 ; DIN 43 760
		Measurement current	**mA**	2
		Filtering		LRC filter
		Passband	**Hz**	1000
		Maximum voltage in common mode	**V**	± 15
		Maximum voltage in serial mode	**V**	± 15
		Maximum resistance of probe cabling	**mΩ**	2-wire : 200
Output	Voltage	Range	**V**	0-10
		Minimum load impedance	**kΩ**	100
		Built-in protection		Reversed polarity and short-circuits
		Maximum voltage in serial mode	**V**	± 15
	Current	Range	**mA**	0-20 ; 4-20
		Maximum load impedance	**Ω**	500
		Built-in protection		Reversed polarity and short-circuits
		Maximum voltage in serial mode	**V**	± 15
	Measurement	Error at 20 °C (for 1 MΩ load on voltage output)	**%**	± 0.2 full scale
		Error at 60 °C	**%**	± 0.6 full scale
		2-wire line error coefficient	**°K/Ω**	+ 2.5

Presentation : page 14005/2 Compatibility : page 14005/4 References : page 14005/5 Dimensions : page 14005/5

Interfaces

For analogue signals
Transmitters for Pt 100 probes

Compatibility with PLCs and AB2-MT system

Analogue input modules

PLC	Multifunction PLCs							TSX 17 micro-PLC		AB2 system		
	Threshold detector			Analogue input modules				Analogue input modules		Module		
	TSX ADT201			**TSX AEM411/AEM811/AEM821**				**TSX AEG4110**	**TSX AEG4111**	**AB2-MT2814**	**AB2-MT2021**	
PLC input range	0-10 V	4-20 mA	0-20 mA	± 10 V	0-10 V	4-20 mA	0-20 mA	± 10 V	4-20 mA	4-20 mA	0-10 V	4-20 mA
Transmitter												
ABA-6PTp1p								(1)				
ABA-6PTp2p												
ABA-6PTp3p												

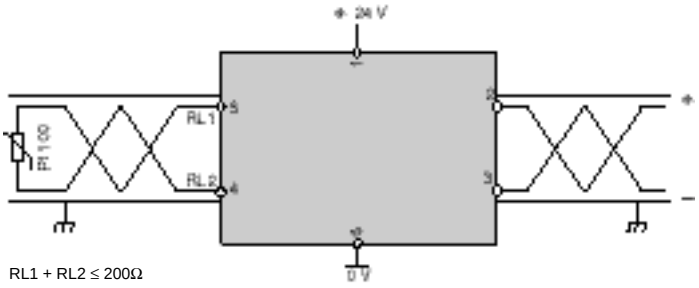
(1) limited to 0 to 10 V

Compatible Not compatible or not applicable

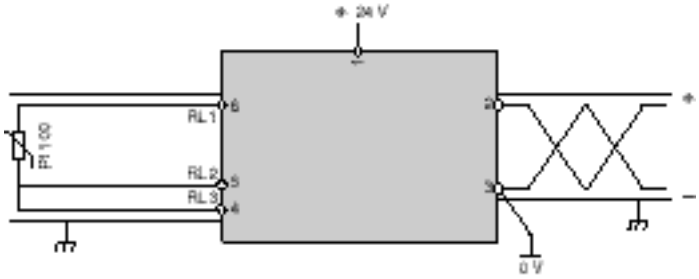
Other compatible products

ABA-6PT modules are compatible with all products with analogue inputs which conform to standard IEC 381.

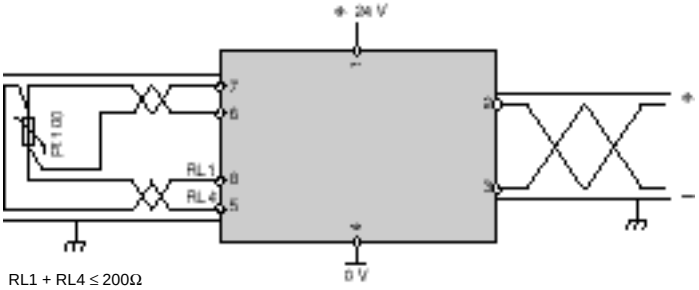
Connection according to the type of cable used



RL1 + RL2 ≤ 200Ω



RL1 = RL2 = RL3
Where RL1 + RL3 ≤ 200Ω



RL1 + RL4 ≤ 200Ω

Cabling for probes
To avoid disrupting the Pt 100 output impedance measurement, it is advisable to take some precautions when connecting the device.

p Type of cables :
- Two-wire cabling : the impedance of the cables can affect the measurement. The cables must have a minimum cross section of 0.22 mm² and their length must be limited to a few metres. Using a screened twisted pair avoids any parasitic voltage.
- Three-wire cabling : three-wire screened twisted conductors should be used.
- Four-wire cabling : a double twisted screened pair cable should be used (one pair for the current power supply, one pair for the measurement).

p Cable routing :
- The measurement wires 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 20 cm between cables), and intersections should be made at right angles.
- In the event of probes being close together they can be connected to the transmitter using multipair cables as these are "current" circuits. However signals of a different type and/or those which have another earth reference should not be connected to these cables. In addition, each probe must be connected to one or two dedicated pairs depending to the type of connection. The same pair must not be used to transmit the measurement current to two probes, as this would alter the measurements.

p Connection of the screening : as a general rule it is recommended that the screen is connected to earth as close as possible to the Pt 100 probe.

Cabling Pt 100 probes
The principles of analogue measurement must be observed, in particular.
p Screened twisted pairs should be used, minimum cross-section 0.22 mm².
p Only circuits with the same earth reference should be connected in the same multipair cable.
p The measurement cables should be kept separate from the discrete I/O cables (especially those of relay outputs) and power cables.
p Parallel routing should be avoided (there should be at least 20 cm between cables) and intersections should be made at right angles.
p Connect the screen to the earth of the receiver component. Refer to the setting up instructions for the product.

Presentation : page 14005/2
Characteristics : page 14005/3
References : page 14005/5
Dimensions : page 14005/5

Interfaces

For analogue signals
Transmitters for Pt100 probes

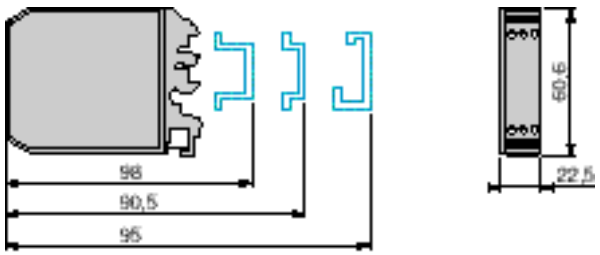
ABA-6PT231

ABA-6PT410

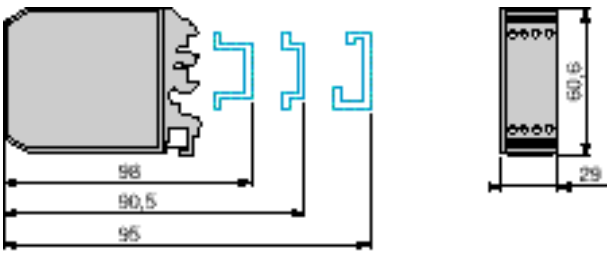
Type of connection	Temperature range	Output signal	Reference	Weight kg
2-wire	0…+ 100 °C	0-10 V	**ABA-6PT211**	0.060
		4-20 mA	**ABA-6PT221**	0.060
		0-20 mA	**ABA-6PT231**	0.060
	0…+ 500 °C	0-10 V	**ABA-6PT212**	0.060
		4-20 mA	**ABA-6PT222**	0.060
		0-20 mA	**ABA-6PT232**	0.060
3-wire	- 100…+ 100 °C	0-10 V	**ABA-6PT310**	0.060
		4-20 mA	**ABA-6PT320**	0.060
		0-20 mA	**ABA-6PT330**	0.060
	- 40...+ 40 °C	4-20 mA	**ABA-6PT324**	0.060
	0…+ 100 °C	0-10 V	**ABA-6PT311**	0.060
		4-20 mA	**ABA-6PT321**	0.060
		0-20 mA	**ABA-6PT331**	0.060
	0…+ 200 °C	4-20 mA	**ABA-6PT323**	0.060
	0…+ 500 °C	0-10 V	**ABA-6PT312**	0.060
		4-20 mA	**ABA-6PT322**	0.060
		0-20 mA	**ABA-6PT332**	0.060
4-wire	- 100…+ 100 °C	0-10 V	**ABA-6PT410**	0.070
	0…+ 100 °C	0-10 V	**ABA-6PT411**	0.070
		4-20 mA	**ABA-6PT421**	0.070
	0…+ 500 °C	0-10 V	**ABA-6PT412**	0.070

Dimensions

ABA-6PT2pp
ABA-6PT3pp



ABA-6PT4pp



Presentation : page 14005/2
Characteristics : page 14005/3
Compatibility : page 14005/4

Interfaces

For analogue signals
Analogue voltage/current transmitters

ABA-6TA analogue transmitters are supplied in the form of compact modules, and are available in 2 widths, 16.5 and 22.5 mm.

In an automated control and monitoring system, these interfaces provide various functions, including :

- 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),
- electrical separation between 2 components,
- electrical separation between signals and the power source making it possible to create "floating voltage" assemblies and preventing the generation of transient leakage currents.

The products are characterized by a single 24 V c power supply; a high level of precision and a high passband of up to 100 Hz which is suitable for most industrial process applications.

Composition

The ABA-6TA range comprises 2 families :

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 both between the signals themselves and between the signals and the 24 V c interface supply.

Interfaces

For analogue signals
Analogue voltage/current transmitters

Selection guide

Electrical isolation	Analogue signals: Input (transmitter)	Output (receiver): ± 10 V	0-10 V	4-20 mA	0-20 mA
Without	0-10 V				
	4-20 mA				
	0-20 mA				
With	± 10 V				
	0-10 V		(1)		
	4-20 mA		(2)		
	0-20 mA				

(1) By using ± 10 V model
(2) By using 0-20 mA model

Functions provided by our products Functions not provided

Environment

Conforming to standards	IEC 947-1; VDE 0110b			
Product approvals				–
Degree of protection	Conforming to IEC 529 (protection against direct contact)			IP XXB
Protective treatment				"TC"
Flame resistance	Conforming to IEC 695-2-1	Incandescent wire	**°C**	850
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves 11 ms	**gn**	50
Vibration resistance	Conforming to IEC 68-2-6	10…55 Hz	**gn**	5
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 3	**kV**	8
Resistance to rapid transients	Conforming to IEC 801-4 Level 3	On power supply	**kV**	2
		On I/O	**kV**	1
Resistance to shock waves	Conforming to IEC 255-4	Waveforms 1.2/50 µs ; 0.5 J	**kV**	0.5
Cross-sections which can be connected	Flexible cable, no cable end	1-wire	**mm²**	0.5...2.5
	Flexible cable with cable end	1-wire	**mm²**	0.22…2.5
		2-wire	**mm²**	≤ 1.5
	Rigid cable	1-wire	**mm²**	0.5…4
Operating position	Any			
Ambient air temperature around the device	Operation	Mounted vertically, touching	**°C**	0…50
		Devices 2 cm apart	**°C**	0…60
	For storage		**°C**	- 40…+ 85
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	7 1 4		

Presentation : page 14006/2
Compatibility : page 14006/5
References, dimensions : page 14006/6
Schemes : page 14006/7

Interfaces

For analogue signals
Analogue voltage/current transmitters

Specific characteristics

Type of interface				ABA-6TAppA	ABA-6TAppB
Supply		Supply voltage	**V**	24 ± 20 % including ripple	24 ± 20 % including ripple
		Maximum voltage without damage	**V**	± 30	± 30
	Maximum current	Voltage output	**mA**	27	102/73/57
	19/24/29 V	Current output (20)	**mA**	42	117/88/72
		Built-in protection		Reversed polarity	Reversed polarity
Input	Voltage	Range	**V**	0 - 10	0 - 10 ; - 10, + 10
		Filtering		LC filter	LC filter
		Passband	**Hz**	100	100
		Attenuation (F > 100 Hz)	**%/kHz**	1	1
		Maximum voltage in common mode	**V**	–	± 15
		Maximum voltage in serial mode	**V**	± 60	± 60
		d.c. input impedance	**kΩ**	≥ 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	**V**	–	± 15
		Maximum voltage in serial mode	**V**	3.5	3.5
		d.c. input impedance	**Ω**	50	50
		Built-in protection		Reversed polarity	Reversed polarity
Output	Voltage	Range	**V**	0 - 10	0 - 10 ; - 10, + 10
		Maximum voltage in common mode	**V**	–	630
		Maximum voltage in serial mode	**V**	± 60	± 60
		d.c. output impedance	**Ω**	100	100
		Load impedance	**kΩ**	≥ 2	≥ 2
		Error introduced by the load	**V**	Us = U - Is x 100 Ω	Us = U - Is x 100 Ω
		Residual ripple		–	30 mV ; 40 kHz
		Built-in protection		Reversed polarity	Reversed polarity
				Short-circuits	Short-circuits
				Overvoltages	Overvoltages
	Current	Range	**mA**	0 - 20 ; 4 - 20	0 - 20 ; 4 - 20
		Maximum voltage in common mode	**V**	–	630
		Maximum voltage in serial mode	**V**	3.5	3.5
		d.c. output impedance	**MΩ**	5	5
		Load impedance	**Ω**	≤ 500	≤ 500
		Residual ripple		–	30 mV ; 40 kHz
		Built-in protection		Reversed polarity	Reversed polarity
				Short-circuits	Short-circuits
				Overvoltages	Overvoltages
Transfer (with 100 kΩ load on "voltage" output)		Error at 20 °C	**%**	± 0.2 full scale	± 0.1 full scale
		Error on 0 - 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**	–	1.5
		Input and output/supply	**kV**	–	1.5

Presentation : page 14006/2 Compatibility : page 14006/5 References, dimensions : :page 14006/6 Schemes : page 14006/7

Interfaces

For analogue signals
Analogue voltage/current transmitters

Compatibility with PLCs and AB2-MT system

Analogue input modules

Transmitter	TSX 7 modular PLC							TSX 17 micro-PLC		Communication interface system		
	Threshold detector			Analogue input module								
	TSX ADT201			TSX AEM411/AEM811/AEM821				TSX AEG4110	TSX AEG4111	AB2-MT2814	AB2-MT2021	
	0-10 V	0-20 mA	4-20 mA	± 10 V	0-20 mA	4-20 mA	0-10 V	± 10 V	4-20 mA	4-20 mA	0-10 V	4-20 mA
ABA-6TAp1p								(2)				
ABA-6TAp2p												
ABA-6TAp3p			(3)			(3)			(3)	(3)		(3)
ABA-6TA00B	(1)										(1)	

Analogue output modules

Transmitter	TSX 7 modular PLC									TSX 17 micro-PLC	
	Analogue output module										
	TSX AST200				TSX ASR200			TSX ASR401	TSX ASR402	TSX ASG2000	TSX ASG2001
	± 10 V	0-20 mA	4-20 mA	0-10 V	± 10 V	0-20 mA	4-20 mA	± 10 V	4-20 mA	±10 V	4-20 mA
ABA-6TA1pp					(2)			(2)		(2)	
ABA-6TA2pp											
ABA-6TA31p											
ABA-6TA3pB											
ABA-6TA00B											

Compatibility with electronic power switching devices

Speed reference input

Transmitter	Altivar 5			Rectivar							Gradipak		
	ATV15, ATV15-1, ATV45-2, ATV45-2V			RTV04, RTV44	RTV54 -1, RTV64-1			RTV74, RTV84			LH1		
	0-10 V	0-20mA	4-20mA	0-10 V	± 10 V	0-20mA	4-20mA	0-10 V	0-20mA	4-20mA	0-10 V	0-20mA	4-20mA
ABA-6TAp1p													
ABA-6TAp2p													
ABA-6TAp3p			(3)				(3)			(3)			(3)
ABA-6TA00B	(1)							(1)			(1)		

Analogue output

Transmitter	Altivar 5			Rectivar	
	ATV45-2, ATV45-2V			RTV74, RTV84	
	0-20mA	4-20mA	0-20mA	± 10 V	
ABA-6TAp1p					
ABA-6TAp2p					
ABA-6TAp3p					
ABA-6TA00B					

(1) With 0-10 V input signal range
(2) Limited to 0 to 10 V
(3) With 4...20 mA input signal range

Compatible Not compatible or not applicable

Presentation : page 14006/2 | Selection guide, characteristics : pages 14006/3 and 14006/4 | References, dimensions : page 14006/6 | Schemes : page 14006/7

Interfaces

For analogue signals
Analogue voltage/current transmitters

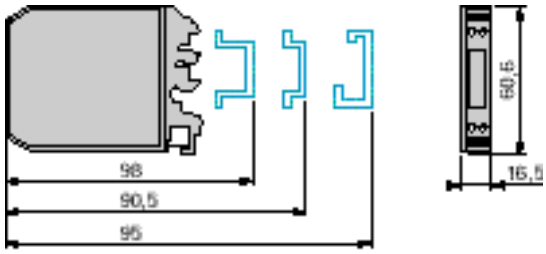
ABA-6TA21A

Electrical isolation	Input signal	Output signal	Reference	Weight kg
Without	0-10 V	0-20 mA	**ABA-6TA13A**	0.065
		4-20 mA	**ABA-6TA12A**	0.065
	4-20 mA	0-10 V	**ABA-6TA21A**	0.065
	0-20 mA	0-10 V	**ABA-6TA31A**	0.070
With	±10 V	± 10 V	**ABA-6TA00B**	0.065
	0-10 V	0-20 mA	**ABA-6TA13B**	0.065
		4-20 mA	**ABA-6TA12B**	0.065
	4-20 mA	0-10 V	**ABA-6TA21B**	0.065
		0-20 mA	**ABA-6TA23B**	0.065
	0-20 mA	0-10 V	**ABA-6TA31B**	0.070
		0-20 mA	**ABA-6TA33B**	0.070
		4-20 mA	**ABA-6TA32B**	0.070

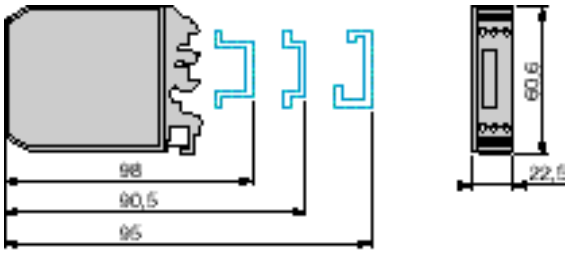
ABA-6TA31B

Dimensions

ABA-6TApp**A**



ABA-6TApp**B**

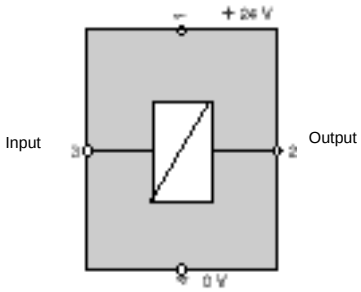


Presentation : page 14006/2
Selection guide, characteristics : pages 14006/3 and 14006/4
Compatibility : page 14006/5
Schemes : page 14006/7

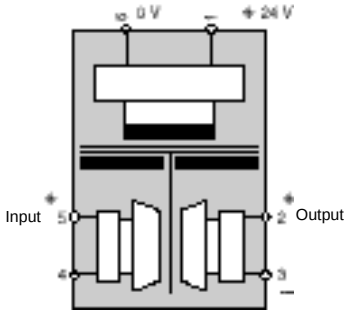
Interfaces

For analogue signals
Analogue voltage/current transmitters

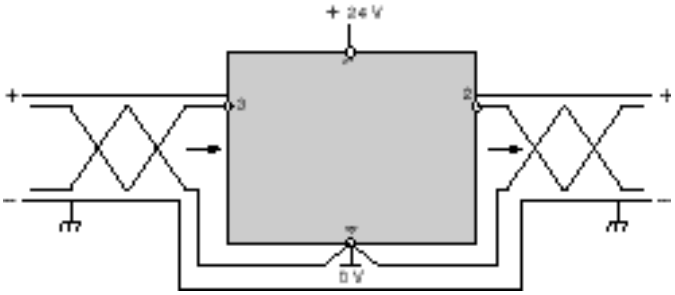
Non-isolated transmitter
ABA-6TApp**A**

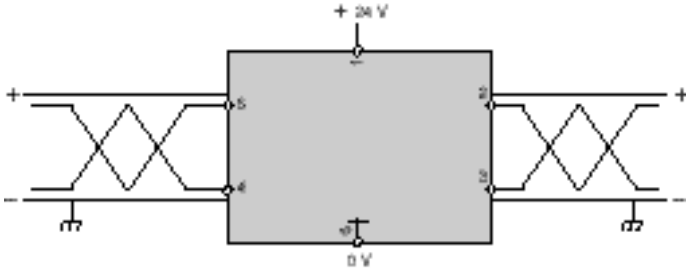


Isolated transmitter
ABA-6TApp**B**



Connection of screen





The principles of analogue measurement must be observed, in particular :
p Screened twisted pairs should be used, minimum cross-section 0.22 mm^2.
p Only circuits with the same earth reference should be connected in the same multipair cable.
p The measurement cables should be kept separate from the discrete I/O cables (especially those of relay outputs) and power cables.
p Parallel routing should be avoided (there should be at least 20 cm between cables) and intersections should be at right angles.
p Connect the screen to the earth of the receiver component.

Interfaces

For analogue signals
Analogue/digital converters

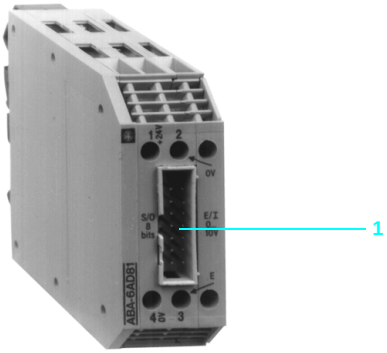
ABA-6AD analogue/digital converters are supplied in the form of compact modules, 22.5 mm wide.

The function of analogue/digital converters is to transform a standard analogue signal (0-10 V ; 0-20 mA ; 4-20 mA) into a digital signal which is coded on discrete digital outputs and can be directly used by the discrete inputs of a processor (PLC ; industrial computer ; etc).

These products are characterized by a very short conversion time (10 or 20 µs) and good linearity.

Composition

The ABA-6AD range comprises 2 families of products :

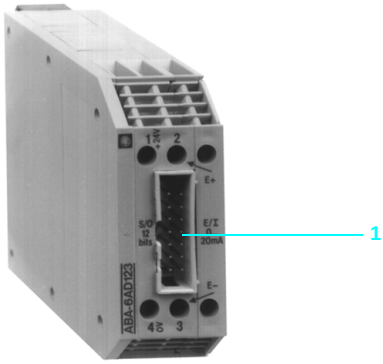


- **8 bit analogue/digital converters**

  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 analogue input is referenced to the 0 V of the module supply.

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



- **12 bit analogue/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 analogue input is differential, which provides improved immunity to interference.

  Input range : 0-10 V
  0-20 mA

1 Section of digital signals via pre-formed cable connector type HE10-14 poles (ABC-6HE14F). Cabling interface ABE-6HE14M is used to connect a connector to screw "clamp type" terminals.
Multiplexing is possible with 2 to 4 AD or DA converters on an ABE-6ADA14M sub-base.

Applications

The main use of analogue/digital converters is in simple applications which only require a small number of analogue inputs. They provide a low-cost solution to the acquisition of analogue signals without the use of boards, which are often oversized and inconvenient.

Interfaces

For analogue signals
Analogue/digital converters

Environment

Conforming to standards	IEC 947-1; VDE 0110b			
Degree of protection	Conforming to IEC-529 (protection against direct contact)			IP 20
Protective treatment				"TC"
Flame resistance	Conforming to IEC 696-2-1	Incandescent wire	**°C**	850
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves 11 ms	**gn**	50
Vibration resistance	Conforming to IEC 68-2-6	10…55 Hz	**gn**	5
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 2	**kV**	4
Resistance to rapid transients	Conforming to IEC 801-4	On power 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-section which may be connected	Flexible cable, no cable end	1-wire	**mm²**	0.5...2.5
	Flexible cable with cable end	1-wire	**mm²**	0.22...2.5
		2-wire	**mm²**	≤ 1.5
	Rigid cable	1-wire	**mm²**	0.5...4
Operating position	Any			
Ambient air temperature around the device	For operation	Mounted vertically, touching	**°C**	0…40
		Devices 2 cm apart	**°C**	0…50
	For storage		**°C**	- 40…+ 85
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	⎽⎺ 2.5 ⎺⎽		

Specific characteristics

Digital output				**8 bits**	**12 bits**
Supply		Supply voltage (V d.c.)	**V**	24 ± 20 % Including ripple	24 ± 20 % Including ripple
		Maximum voltage without damage	**V**	± 30	± 30
		Maximum current consumed	**mA**	50 + output current	17 + output current
Analogue input	Voltage	Range	**V**	0-10	0-10
		Filtering		LC filter	LC filter
		Passband	**Hz**	20 000	400
		Maximum voltage in common mode	**V**	–	± 15
		Maximum voltage in serial mode	**V**	60	60
		d.c. input impedance	**kΩ**	≥ 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	**V**	–	± 15
		Maximum voltage in serial mode	**V**	3.5	3.5
		d.c. input impedance	Ω	50	50
		Built-in protection		Reversed polarity	Reversed polarity
"HOLD" input		Rated voltage	**V** ⎓	24	24
		Maximum voltage	**V** ⎓	30	30
		State 1 U ≥ ; I ≥	**V** ⎓	18 ; 2 mA	18 ; 2 mA
		State 0 U ≤ ; I ≤	**V** ⎓	12 ; 1.2 mA	12 ; 1.2 mA
Discrete digital outputs		Number		8	12
		Rated voltage	**V** ⎓	24	24
		Maximum voltage (0 mA)	**V** ⎓	V d.c. – 1	V d.c. – 1
		Maximum current per output	**mA**	25	25
		Maximum volt drop	**V**	4	4
		Impedance	**kΩ**	125	125
Conversion		Conversion time	**µs**	10	20
		Non linearity		± 1LSB	± 1/2 LSB
		Maximum error at 20 °C		± 1LSB	± 1LSB
	Temperature error coefficient	0-10 V output	**ppm/°K**	50	25
		0-20 mA output	**ppm/°K**	80	40
		4-20 mA output	**ppm/°K**	90	–
	Resolution	0-10 V output	**mV**	39	2.441
		0-20 mA output	**µV**	78.1	4.883
		4-20 mA output	**µA**	65.5	–

Presentation : page 14007/2
Compatibility : page 14007/4
References : page 14007/5

Interfaces

For analogue signals
Analogue/digital converters

Compatibility with PLCs

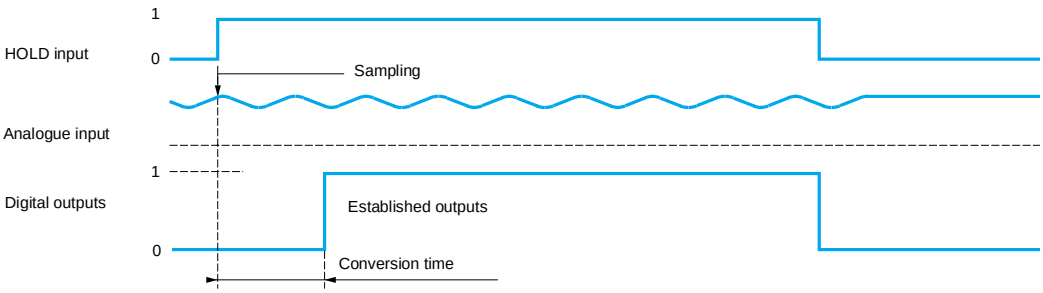
ABA-6AD analogue/digital converters are compatible with the discrete signals of:

- Multifunction PLCs fitted with input modules TSX DET812, DET1612, DET3212 or output modules TSX DST882, DST1682, DST2482, DST3292 or DST2472.
- Basic TSX 17 micro-PLCs :
  - TSX 1722028, 1723428 with relay outputs,
  - TSX 1722012, 1724012 with ⎓ 24 V transistor outputs,
  - TSX 1723428, 1722012, 1724012 with ⎓ 24 V inputs.
- Discrete I/O extensions for TSX 17 micro-PLCs :
  Discrete extension blocks :
  - TSX DMF242A, DMF342A with ⎓ 24 V inputs and relay outputs,
  - TSX DMF400, DMF401 with ⎓ 24 V inputs and outputs.
  Discrete extension modules :
  - TSX DEF812 with ⎓ 24 V inputs,
  - TSX DSF612 with ⎓ 24 V outputs.
- Any PLC with discrete inputs conforming to IEC 65A (CO22) class 1, or discrete outputs compatible with class 1 inputs.

Operation

ABA-6AD modules convert analogue signals on command from the processor by means of a sampling signal "Hold", 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 processor, and thus a simple multiplexing of several analogue inputs.

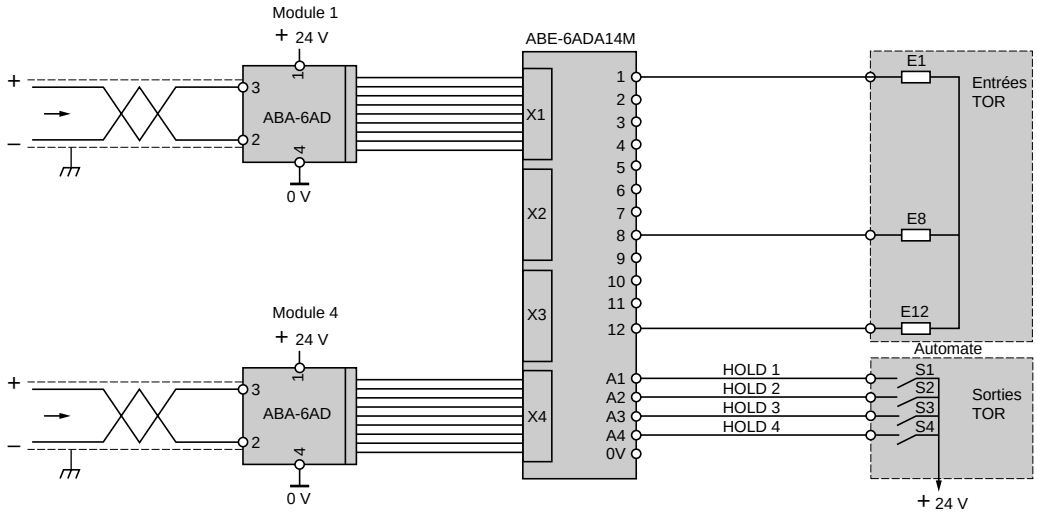
Operating diagram



The principles of analogue measurement must be observed, in particular :
- screened twisted pairs should be used, minimum cross-section 0.22 mm^2,
- 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 20 cm between cables) and intersections should be made at right angles.

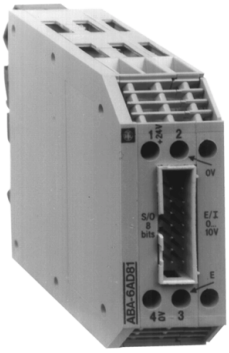
Cabling digital I/O
They are connected using a ribbon cable fitted with 2 HE10 14-pin female connectors. Cabling interface ABA-6HE14M is used to connect the cable to the screw terminals.

Multiplexing several analogue inputs (circuit diagram with 2 analogue inputs)



Interfaces

For analogue signals
Analogue/digital converters



ABA-6AD81

Analogue signal input	Digital output	Reference	Weight kg
0-10 V	8 bit	**ABA-6AD81**	0.065
	12 bit	**ABA-6AD121**	0.065
0-20 mA	8 bit	**ABA-6AD83**	0.065
	12 bit	**ABA-6AD123**	0.065
4-20 mA	8 bit	**ABA-6AD82**	0.065

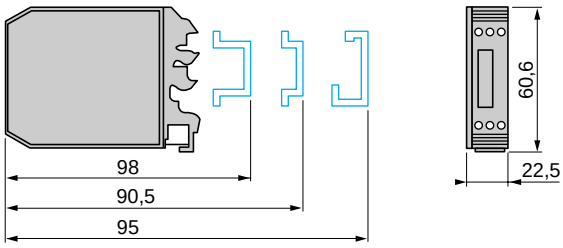
ABA-6AD123

Cabling accessories

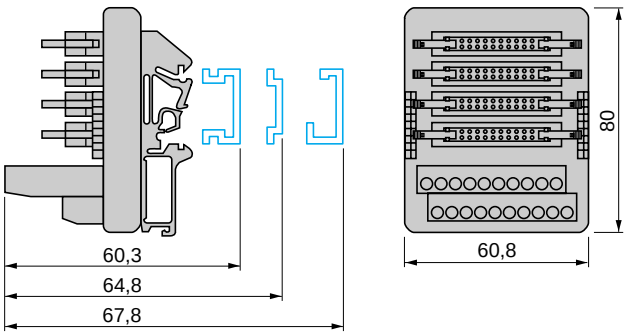
Description	Sold in lots of	Unit reference	Weight kg
Cabling interface connector/screw terminals	1	**ABE-6HE14M**	0.075
Cable with connectors, length 20 cm	1	**ABF-H14H020**	0.008
HE10 14-pin female connector	2	**ABC-6HE14F**	0.005
14-core pre-formed cable, length 5 m	1	**ABF-C14N050**	0.520
Multiplexer sub-base for analogue/digital or digital/analogue converters (Equipped with 4 HE 10 14-pin male connectors).	1	**ABE-6ADA14M**	0.150

Dimensions, schemes

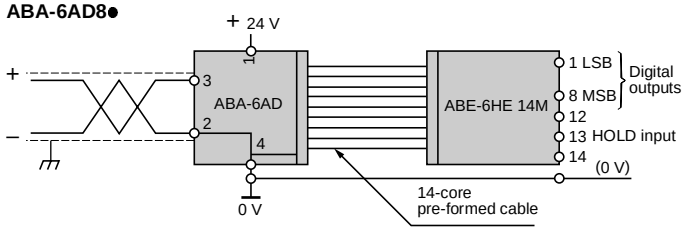
Dimension
ABA-6AD



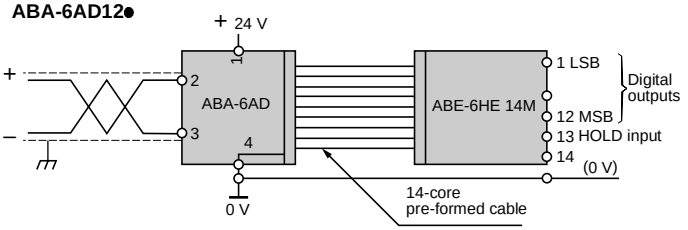
ABE-6ADA14M



Circuit diagrams
ABA-6AD8●



ABA-6AD12●



Presentation : page 14007/2 **Characteristics :** page 14007/3 **Compatibility :** page 14007/4

Interfaces

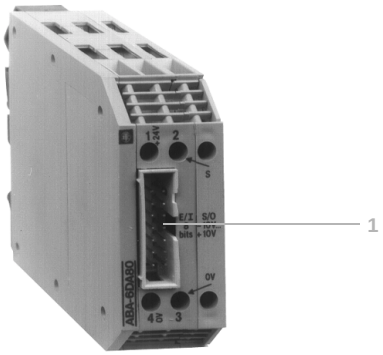
For analogue signals
Digital/analogue converters

ABA-6DA digital/analogue converters are supplied in the form of compact modules, 22.5 mm wide.

The function of digital/analogue converters is to generate a standard analogue signal (0-10 V ; 0-20 mA) which is sent by a processing unit (PLC, industrial computer, etc.) and coded in binary on the discrete digital outputs connected to the digital inputs of the converter.

These products are characterised by a very short conversion time (20 or 13 µs) and good linearity.

Composition



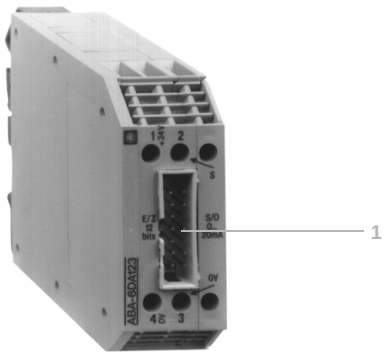
The ABA-6DA range comprises 2 families of products :

- **8 bit digital/analogue 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 analogue output is referenced to the 0 V of the module supply.

  Output range :
  0 - 10 V ; ± 10 V,
  0 - 20 mA



- **12 bit digital/analogue 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 V ; ± 10 V,
  0 - 20 mA

1 Connection of digital (discrete) signals via ribbon cable connector type HE10 14-pole. Cabling interface ABA-6HE14M is used to connect a connector to the screw terminals.
Multiplexing of 2 to 4 digital/analogue converters is possible using baseplate ABE-6ADA14M.

Applications

The main use of digital/analogue converters is in simple applications which only require a small number of analogue outputs. They provide a low cost solution to the generation of analogue signals without the use of boards, which are often oversized and inconvenient.

Characteristics : page 14008/3
Compatibility : page 14008/4
References : page 14008/5

Interfaces

For analogue signals
Digital/analogue converters

Environment

Conforming to standards	IEC 947-1 ; VDE 0110b			
Product certifications				
Degree of protection	Conforming to IEC 529 (protection against direct contact)			IP 20
Protective treatment				"TC"
Flame resistance	Conforming to IEC 696-2-1	Incandescent wire	**°C**	850
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves 11 ms	**gn**	50
Vibration resistance	Conforming to IEC 68-2-6	10…55 Hz	**gn**	5
Resistance to electrostatic discharge	Conforming to IEC 801	Level 3	**kV**	8
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 without cable end	1 conductor	**mm²**	0.5…2.5
	Flexible with cable end	1 conductor	**mm²**	0.22…2.5
		2 conductors	**mm²**	≤ 1.5
	Solid cable	1 conductor	**mm²**	0.5…4
Operating position	All			
Ambient air temperature around the device	Operation	Mounted vertically, touching	**°C**	0…40
		Devices 2 cm apart	**°C**	0…50
	Storage		**°C**	- 40…+ 85
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	⎓ 2.5 ⎓		

Special characteristics

Digital output				**8 bit**	**12 bit**
Supply		Supply voltage	**V**	24 ± 20 % including ripple	24 ± 20 % including ripple
		Maximum voltage without damage	**V**	± 30	± 30
		Maximum current consumed	**mA**	55	70
Analogue output	Voltage	Range	**V**	0 - 10	0 - 10
		Maximum voltage in serial mode		± 15	± 15
		d.c. output impedance	Ω	100	100
		Minimum load impedance	**k**Ω	100	100
		Built-in protection		Reversed polarity	Reversed polarity
				Overvoltages	Overvoltages
				Short-circuits	Short-circuits
		Maximum residual ripple	**mV**	4	4
	Current	Range	**mA**	0 - 20	0 - 20
		Maximum voltage in serial mode	**V**	± 15	± 15
		d.c. output impedance	**M**Ω	> 5	> 5
		Maximum load impedance	Ω	500	500
		Built-in protection		Reversed polarity	Reversed polarity
				Overvoltages	Overvoltages
				Short-circuits	Short-circuits
		Maximum residual ripple	**mV**	4	4
"HOLD" and discrete digital input		Rated voltage	**V** ⎓	24	24
		Maximum voltage	**V** ⎓	30	30
		State 1 U ≥ ; I ≥	**V/mA**	18/0.4	18/0.4
		State 0 U ≤ ; I ≤	**V/mA**	12/0.2	12/0.2
Conversion		Maximum conversion time	**µs**	20	13
		Non-linearity		± 1/2 LSB	± 1/4 LSB
		Maximum error at 20 °C (1)		± 1/2 LSB	± 1/2 LSB
	Temperature error coefficient	0 - 10 V output	**ppm/°K**	50	18
		0 - 20 mA output	**ppm/°K**	50	25
		± 10 V output	**ppm/°K**	100	35
	Resolution	0-10 V output	**mV**	39	2.441
		± 10 V output	**mV**	78.1	4.883
		0 - 20 mA output	**µA**	78.1	4.883

(1) On an output voltage load ≥ 1 MΩ.

Presentation : page 14008/2 Compatibility : page 14008/4 References : page 14008/5

Interfaces

For analogue signals
Digital/analogue converters

Compatibility with PLCs

ABA-6DA digital/analogue converters are compatible with the discrete signals of :

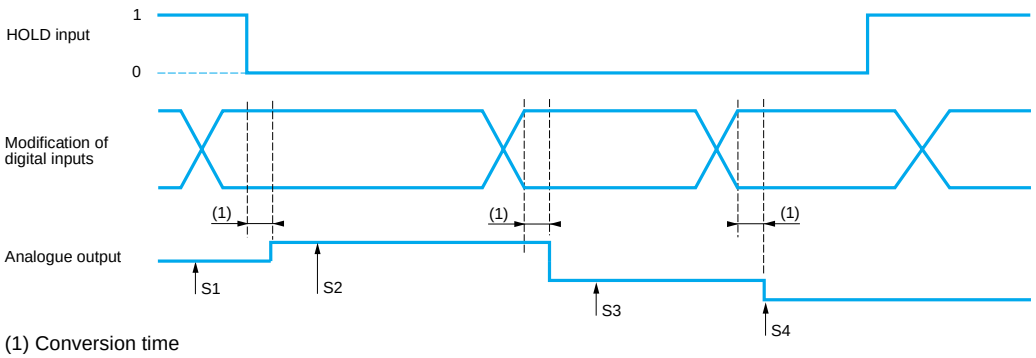
- Multifunction PLCs fitted with discrete output modules, type TSX DST882, DST1682, DST3292, DST2482, DST2472.
- Basic PLCs :
  - TSX 1712028, TSX 1713428 with relay outputs,
  - TSX 1712002, TSX 1714002 with ⎓ 24 V transistor outputs,
  - TSX 1722012, TSX 1724012 with ⎓ 24 V transistor outputs,
  - TSX 1723428, TSX 1722028 with transistor inputs and relay outputs.
- Discrete I/O extensions for TSX 17 micro-PLCs :
  Discrete extension blocks :
  - TSX DMF400, DMF401 with ⎓ 24 V inputs and outputs,
  - TSX DMF242A, DMF342A with ⎓ 24 V inputs and relay outputs.
- Communication interface system :
  AB2-MT284 modules, MT2814 with relay outputs.

Any PLC with ⎓ 24 V solid state and discrete relay outputs compatible with standard IEC 65A (CO22) class 1 inputs.

Operation

ABA-6DA modules convert analogue signals on command from the processing unit in the form of a discrete 24 V “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 analogue outputs.

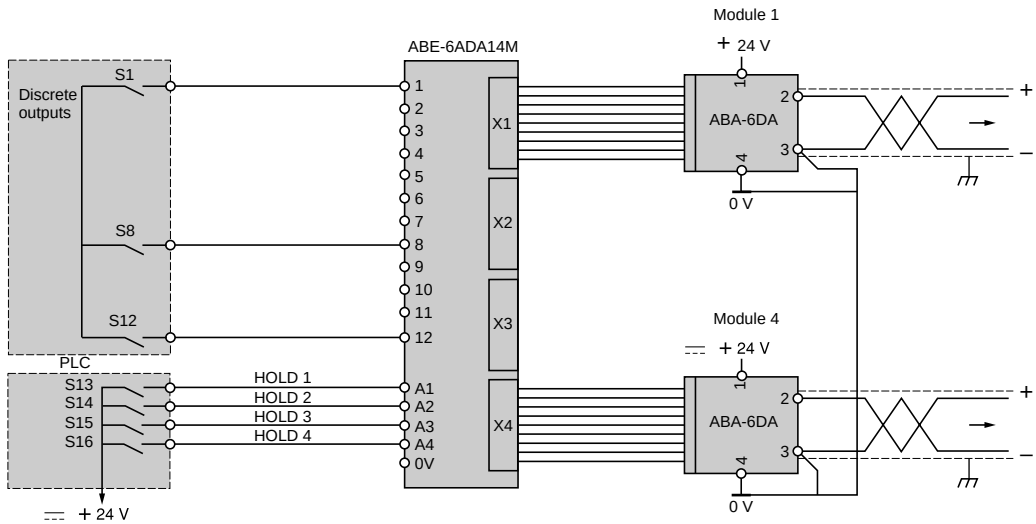
Operating diagram



(1) Conversion time
The principles of analogue measurement must be observed, in particular :
- using a minimum cross-section of 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 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 HE 10 14-pin female connectors. Cabling interface ABE-6HE14M or ABE-6ADA14M is used to connect the individual wires of the cable to the screw terminals.
Multiplexing several analogue outputs (scheme for analogue outputs with 12 bit converters).



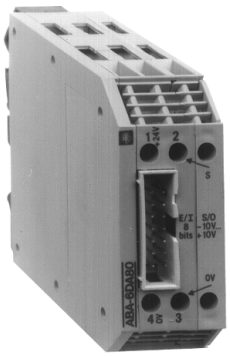
Presentation : page 14008/2
Characteristics : page 14008/3
References : page 14008/5

Interfaces

For analogue signals
Digital/analogue converters

References

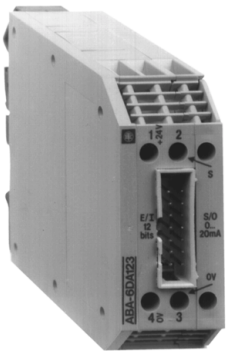
Digital/analogue converters



ABA-6DA80

Digital input	Analogue output signal	Reference	Weight kg
8 bit	0 - 10 V	**ABA-6DA81**	0.056
	± 10 V	**ABA-6DA80**	0.056
	0 - 20 mA	**ABA-6DA83**	0.056
12 bit	0 - 10 V	**ABA-6DA121**	0.056
	± 10 V	**ABA-6DA120**	0.056
	0 - 20 mA	**ABA-6DA123**	0.056

Cabling accessories



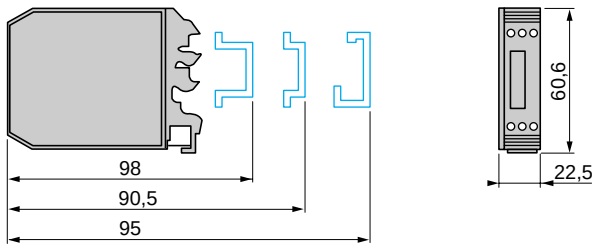
ABA-6DA123

Description	Sold in lots of	Unit reference	Weight kg
Cabling interface connector/screw terminals	1	**ABE-6HE14M**	0.075
Cable with connectors, length 20 cm	1	**ABF-H14H020**	0.008
HE10 14-pin female connector	2	**ABC-6HE14F**	0.005
14-core pre-formed cable, length 5 m	1	**ABF-C14N05**	0.520
Multiplexing baseplate for digital/analogue or analogue/digital converters (fitted with 4 HE 10 14-pin male connectors).	1	**ABE-6ADA14M**	0.150

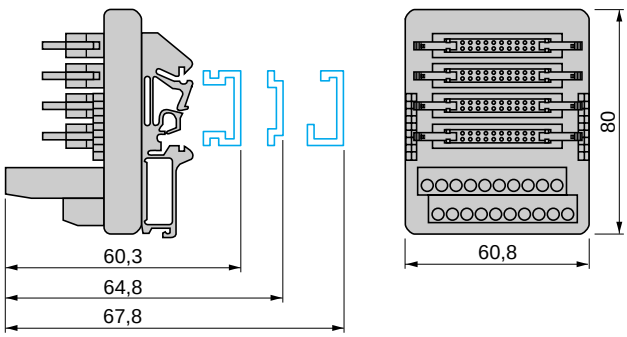
Dimensions, schemes

Dimensions

ABA-6DA8●●/DA12●

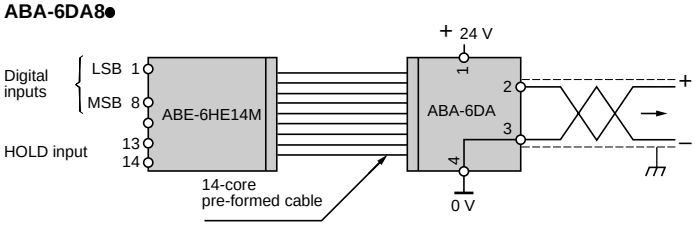


ABE-6ADA14M

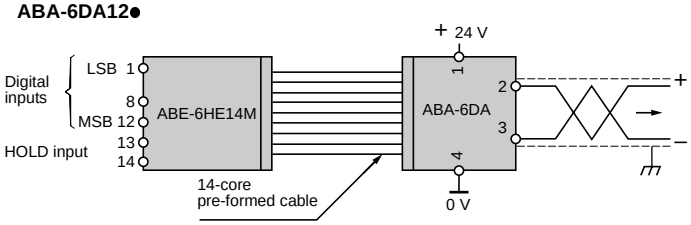


Schemes

ABA-6DA8●



ABA-6DA12●



Presentation : page 14008/2
Characteristics : page 14008/3
Compatibility : page 14008/4

Interfaces

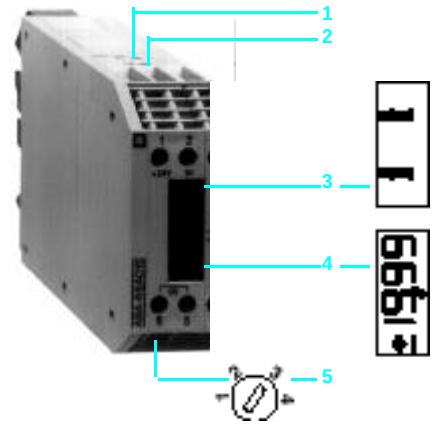
For analogue signals
Analogue threshold detectors

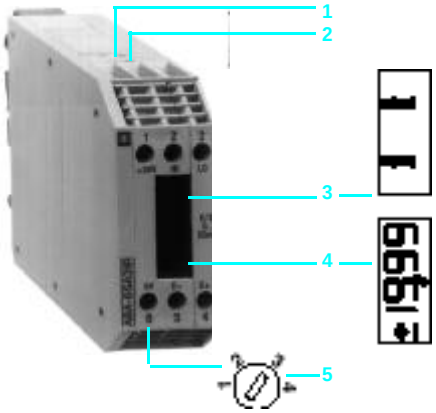
ABA-6SA threshold detectors are supplied in the form of compact modules, 22.5 mm wide.

The function of these modules is to monitor the level of a standard analogue signal (0-10 V; 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.

These 2 discrete outputs can then be used by a processor (PLC ; computer ; etc) or for direct control of preactuators (contactors ; valves ; etc).

Composition





1 Potentiometer for adjusting upper threshold "HI"
2 Potentiometer for adjusting lower threshold "LO"
3 Test points for measuring the signal and the thresholds using a digital voltmeter
4 3 1/2 digit liquid crystal display (LCD)
5 Switch for selecting the value to be displayed
1 and 4 : input signal
2 : “LO” threshold
3 : ”HI” threshold

The ABA-6SA range comprises 2 families of products available in 2 versions, with or without liquid crystal display (LCD) :

Threshold detectors with solid state outputs

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

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

Input range :	± 10 V
	0-20 mA

Threshold detectors with relay outputs

These interfaces have two relay outputs whose common is connected to the c 24 V module supply. These 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 analogue input is differential and isolated from the discrete outputs and the module supply.

Input range :	± 10 V
	0-20 mA

Applications

The main use of analogue threshold detectors is in simple applications. They provide a low-cost solution to the provision of discrete regulation functions, pressure switch type functions, and where pressure regulators are used with analogue output sensors.

Characteristics : page 14009/3
Compatibility : page 14009/4
References : page 14009/5

Interfaces

For analogue signals
Analogue threshold detectors

Environment

Conforming to standards	IEC 947-1 ; VDE 0110b			
Product approvals				–
Degree of protection	Conforming to IEC 529 (Protection against direct contact)			IP 20
Protective treatment				"TC"
Flame resistance	Conforming to IEC 696-2-1	Incandescent wire	**°C**	850
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves 11 ms	**gn**	50. 10 (relay output)
Vibration resistance	Conforming to IEC 68-2-6	10…55 Hz	**gn**	5
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 3	**kV**	8
Resistance to rapid transients	Conforming to IEC 801-4 Level 3	On power 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-section which may be connected	Flexible cable, no cable end	1-wire	**mm²**	0.5…2.5
	Flexible cable with cable end	1-wire	**mm²**	0.22…2.5
		2-wire	**mm²**	≤ 1.5
	Rigid cable	1-wire	**mm²**	0.5…4
Operating position	Any			
Ambient air temperature around the device	Operation	Mounted vertically, touching	**°C**	0…50
		Devices 2 cm apart	**°C**	0…60
	Storage		**°C**	- 40…+ 85
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	7 1 4		

Special characteristics

Reference				**ABA-6SAppS**	**ABA-6SAppR**
Supply		Supply voltage	**V**	24 ± 20 % including ripple	24 ± 20 % including ripple
		Maximum voltage without damage	**V**	± 30	± 30
		Maximum current	**mA**	7 + output current	30 + output current
		Built-in protection		Reversed polarity	Reversed polarity
Input	Voltage	Range	**V**	±10	±10
		Filtering		LC filtering	LC filtering
		Passband	**Hz**	1000	100
		Maximum voltage in common mode	**V**	–	± 500
		Maximum voltage in serial mode	**V**	± 50	± 50
		d.c. input impedance	**kΩ**	≥ 200	≥ 200
		Built-in protection		Reversed polarity	Reversed polarity
	Current	Range	**mA**	0…20	0…20
		Filtering		LC filtering	LC filtering
		Passband	**Hz**	1000	100
		Maximum voltage in common mode		–	± 500
		Maximum voltage in serial mode	**V**	± 5	± 5
		d.c. input impedance	**Ω**	100	100
		Built-in protection		Reversed polarity	Reversed polarity
Digital display		Type		LCD 3 1/2 digits ± 19.99	LCD 3 1/2 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
Threshold adjustment		Voltage range	**V**	± 10	± 10
		Current range	**mA**	0…20	0…20
Discrete outputs		Type		Positive log transistor	N/O relay contact
		Voltage	**V**	c 24	c 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 20 °C		10 mV/10 µA	10 mV/10 µA
		Temperature error coefficient	**ppm/°K**	75	75
		Error in range at 60 °C	**%**	0.4 full scale	0.4 full scale
Isolation		Analogue input/24 V supply	**V rms**	–	500
		Open contacts	**V rms**	–	750

Presentation : page 14009/2
Compatibility : page 14009/4
References : page 14009/5

Interfaces

For analogue signals
Analogue threshold detectors

Compatibility with PLC inputs

ABA-6SA analogue threshold detectors are compatible with Telemecanique PLCs :

p Multifunction PLCs :

- TSX 47, TSX 67 or TSX 87 fitted with an input module,
- TSX DET812, DET1612 or DET3212.

p Basic TSX 1710 micro PLCs

p Basic TSX 1722028, 1723428, 1722012, 1724012 micro PLCs

p Discrete I/O extensions : for TSX 17 micro PLCs :

- discrete extension block : TSX DMF242A, DMF342A, DMF400, DMF401,
- discrete extension module : TSX DEF812.

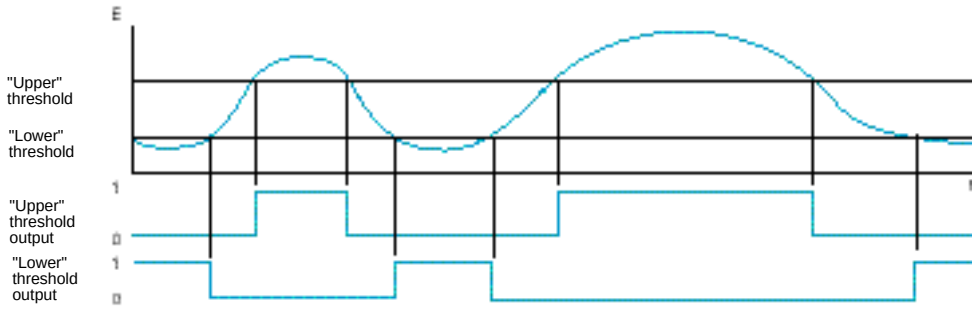
ABA-6SA detectors are also compatible with any PLC which has class 1 discrete inputs conforming to IEC 65A (CO22).

Operation

The setpoint thresholds are set on the module using 2 potentiometers. Adjustment is made easy by access to the setpoint value at 2 test points on the front panel (version without display) or via the 3 1/2 digit display. Data available on the test points or the display is selected using a switch.

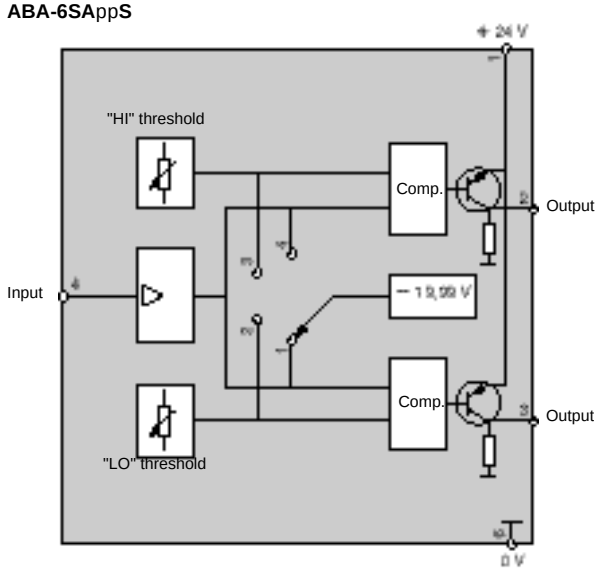
A digital voltmeter set to c 2 volts is used for performing measurements at the test points.

Operating diagram

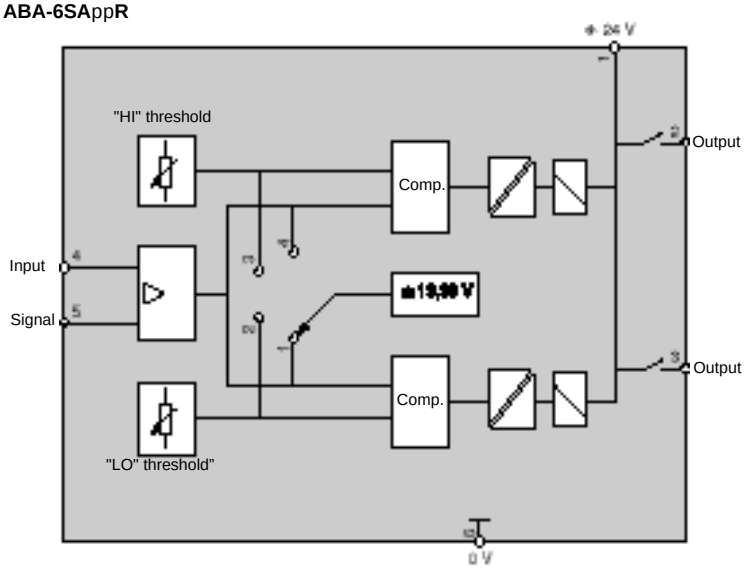


Internal circuit diagrams

ABA-6SApp**S**



ABA-6SApp**R**



Presentation : page 14009/2
Characteristics : page 14009/3
References : page 14009/5

Interfaces

For analogue signals
Analogue threshold detectors

ABA-6SA01S

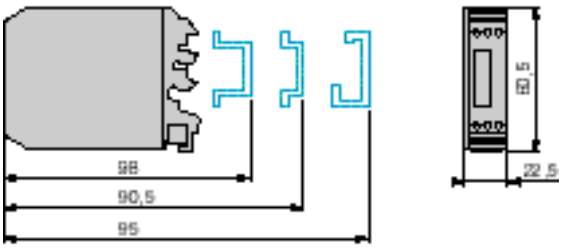
ABA-6SA31R

Analogue detectors with 2 setpoint thresholds

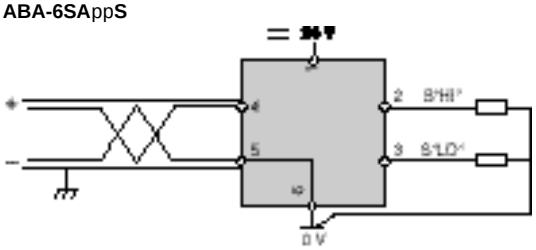
Type	Input signal	c 24 V discrete outputs	I/O isolation	Reference	Weight kg
Without display	± 10 V	Solid state	Without	**ABA-6SA00S**	0.065
		Relay	With	**ABA-6SA00R**	0.065
	0-20 mA	Solid state	Without	**ABA-6SA30S**	0.065
		Relay	With	**ABA-6SA30R**	0.065
With display (LCD display)	± 10 V	Solid state	Without	**ABA-6SA01S**	0.065
		Relay	With	**ABA-6SA01R**	0.065
	0-20 mA	Solid state	Without	**ABA-6SA31S**	0.065
		Relay	With	**ABA-6SA31R**	0.065

Dimension, schemes

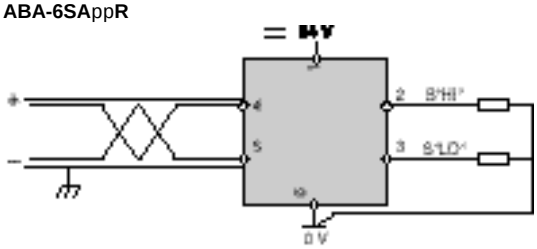
Dimension
ABA-6SApp**S/R**



Circuit diagrams
ABA-6SApp**S**



ABA-6SApp**R**

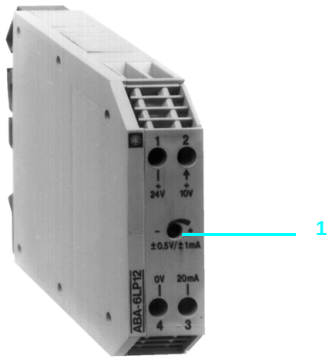


Presentation : page 14009/2 **Characteristics :** page 14009/3 **Compatibility :** page 14009/4

Interfaces

For analogue signals
Reference sources for potentiometers

Presentation



ABA-6LP voltage reference sources for potentiometers are supplied in the form of compact modules, 16.5 mm wide.
The function of these modules is to generate, from a ⎓ 24 V voltage, a stable reference voltage (or current) to supply a potentiometer.
These modules are characterised by a high level of stability compared to variation in the ambient temperature and fluctuations in the supply voltage.

Applications
ABA-6LP voltage reference sources are used with precision potentiometers for setpoint displays, or detection of linear or rotational positions.
There are 2 versions in the range :
- a 10 V ± 0.5 V voltage source
- a 10 V ± 0.5 V 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.

Environment

Conforming to standards	IEC 947-1 ; VDE 0110b			
Product approvals				–
Degree of protection	Conforming to IEC 529 (protection against direct contact)			IP 20
Protective treatment				"TC"
Flame resistance	Conforming to IEC 696-2-1	Incandescent wire	**°C**	850
Shock resistance	Conforming to IEC 68-2-27	Semi-sinusoidal waves 11 ms	**gn**	50
Vibration resistance	Conforming to IEC 68-2-6	10…55 Hz	**gn**	5
Resistance to electrostatic discharges	Conforming to IEC 801-2	Level 2	**kV**	4
Resistance to rapid transients	Conforming to IEC 801-4	On power supply	**kV**	2
	Level 3	On I/O	**kV**	1
Resistance to shock waves	Conforming to IEC 255-4	Waveforms 1.2/50 µs ; 0.5 J	**kV**	0.5
Cross-sections which may be connected	Flexible cable, no cable end	1-wire	**mm²**	0.5…2.5
	Flexible cable with cable end	1-wire	**mm²**	0.22…2.5
		2-wire	**mm²**	≤ 1.5
	Rigid cable	1-wire	**mm²**	0.5…4
Operating position	Any, (For horizontal position derating, please consult your Regional Sales Office)			
Ambient air temperature around the device	Operation	Mounted vertically, touching	**°C**	See curve page 14010/3
		Devices 2 cm apart	**°C**	See curve page 14010/3
	Storage		**°C**	- 40…+ 85
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	⎍ 2.5 ⎎		

Special characteristics

Reference				**ABA-6LP01**	**ABA-6LP12**
Power supply		Supply voltage	**V** ⎓	15…30	24 ± 20 %
		Maximum voltage without damage	**V** ⎓	300	30
		Maximum current	**mA**	10 + output current	10 + output current
		Built-in protection		Reversed polarity	Reversed polarity
Output	Voltage	Rated voltage	**V** ⎓	10	10
		Voltage adjustment range	**V**	± 0.5	± 0.5
		Maximum current	**mA**	30 (see curve p. 14010/3)	30 (see curve p. 14010/3)
		Effect of the load	**%**	≤ 1	≤ 1
		Effect of the temperature	**ppm/°K**	30	30
	Current	Rated current	**mA**	–	20 (see curve p. 14010/3)
		Current adjustment range	**mA**	–	± 1
		Load	Ω	–	≤ 500
		Effect of 0 to 500 Ω load	**%**	–	≤ 0.25 full scale
		Effect of the temperature	**ppm/°K**	–	40

References :
page 14010/3

Interfaces

For analogue signals
Reference sources for potentiometers

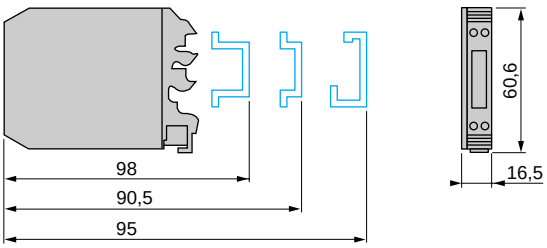
ABA-6LP12

References

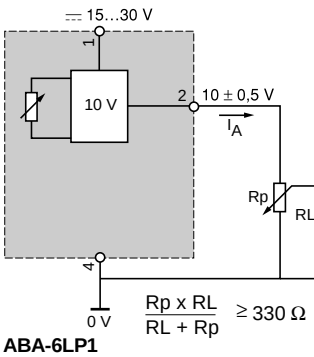
current supply	current output voltage	current	Reference	Weight
V	**V**	**mA**		kg
15...30	**10**	**–**	**ABA-6LP01**	0.070
24	**10**	**20**	**ABA-6LP12**	0.070

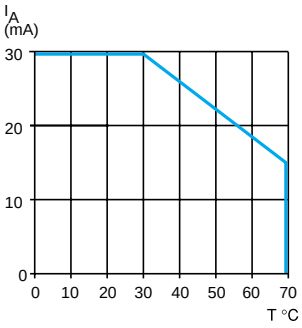
Dimensions, schemes, curves

Dimensions

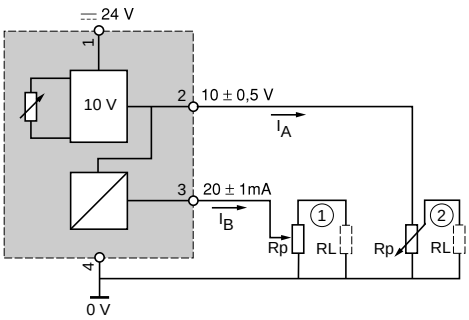


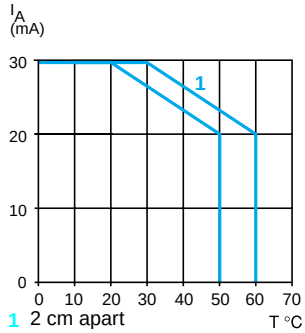
Circuit diagrams and derating curves as a function of the ambient temperature (vertical mounting)
ABA-6LP01

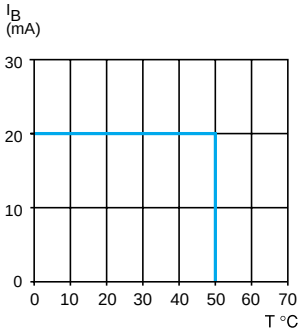




ABA-6LP1







① $Rp \gg RL$; $Rp + RL \leq 2000\ \Omega$

② $Rp \leq 500\ \Omega$; $\frac{Rp \times RL}{Rp + RL} \geq 330\ \Omega$

Presentation :
page 14010/2