

AER-D13, programmable relay station

Features

- Controls three relays with one analog input
- Up to 8A-250VAC per relays
- Signal LED for each relays
- Status LED
- Easy installation for cabinet mounting and DIN rail
- 0/2...10V or 0/4...20mA input signals, selectable with jumpers
- Free programmable switching points for each relays with common programmable hysteresis
- Relays can be configured to work in combined or single mode by jumper or binary coded mode (set per parameter).



Applications

- Control of three fan speeds with one analog output
- Control of up to three heating or cooling stages
- Switching of up to 250VAC-8A with a low power device
- Setting any combination of relays based on an input signal

Functions

The AER-D13 is capable of measuring an analog input value from 0-10VDC or 0-20mA and converts it to a 3 relays output signal. The relays function can be set by jumper from combined to single switching mode or by parameter for binary mode (binary coded mode means 01, 10, 11 etc.). The detailed settings may be programmed by the use of an external display and configuration device called OPA-S or OPU-S.

The input signal range and type may be customized by jumpers for standard signals and if required by the OPA-S or OPU-S for exotic signals or combination of more than one AER-D13 on one output signal.

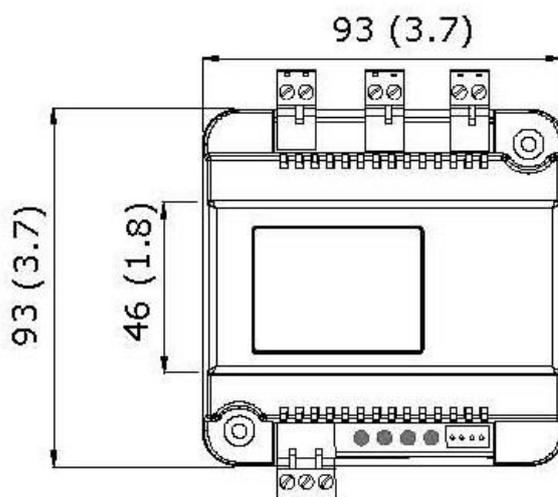
Minimum and maximum values

Using the programming tool, the user has the option to read out and reset minimum and maximum values. The minimum and maximum values are saved into the EEPROM and are available after a power interruption.

Ordering

Model	Item code	AI	DO	Description
AER-D13	40-500054	1	3	Analog to 3 relays converter
OPA-S	40-500006	0	0	Tool to configure the AER-D13
OPU-S	40-500030	0	0	Tool to configure the AER-D13

Dimensions mm (in)



Technical specification

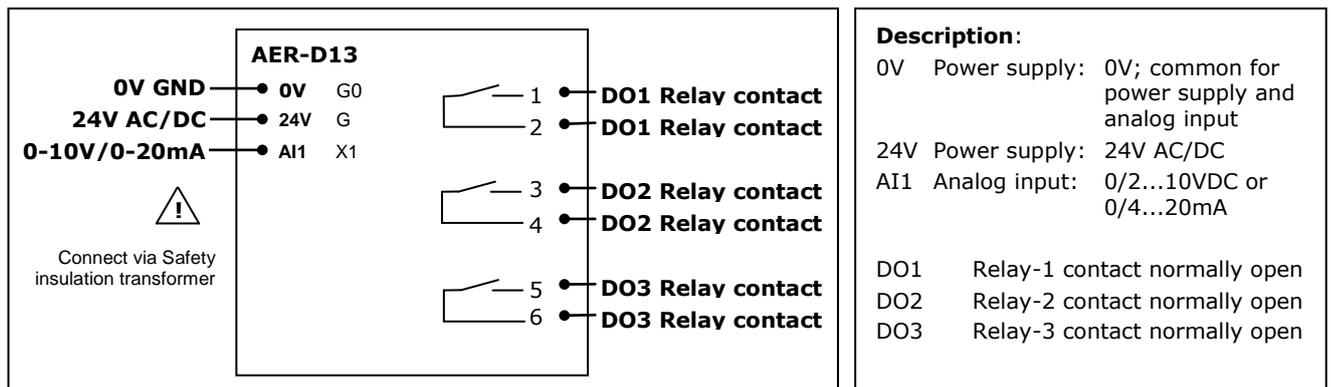
Important notice and safety advice!

This device is for use as operating controls. It is not a safety device! Where a device failure endangers human life and/or property, it is the responsibility of the client, installer and system designer to add additional safety devices to prevent a system failure caused by such a device failure.

Ignoring specifications and local regulations may cause equipment damage and endangers life and property. Tampering with the device and misapplication will void warranty.

Power supply	Power requirements	12 – 26 VAC , 50/60 Hz, SELV to HD 384, Class II, 48VA max 12 – 30 VDC
	Power consumption	Max.1,5VA, 1W
	Terminal connectors	For wire 0.34...2.5 mm ² (AWG 24...12)
Signal inputs	Universal input	Analog input
	Input signal	0...10 V or 0...20 mA
	Resolution	9.76 mV or 0.019 mA (10 bit)
	Impedance	Voltage: 98kΩ current: 240Ω
Signal outputs	Relays outputs	
	AC voltage	0...250 VAC, 5A max. each output
	DC voltage	0...30 VDC 5A max. each output
	Insulation strength between relays or TRIAC contacts and system electronics: between neighboring contacts:	3750V AC to EN 60 730-1 1250V AC to EN 60 730-1
Environment	Operation: Climatic conditions	To IEC 721-3-3 class 3 K5
	Temperature	0...50 °C (32...122 °F)
	Humidity	<95 % r.H. non-condensing
	Mechanical conditions	class 2M2
	Transport & storage: Climatic conditions	To IEC 721-3-2 and IEC 721-3-1 class 3 K3 and class 1 K3
	Temperature	-25...70 °C (-13...158 °F)
	Humidity	<95 % r.H. non-condensing
	Mechanical conditions	class 2M2
Standards	conformity EMC directive Low voltage directive	2004/108/EC 2006/95/EC
	Product standards Automatic electrical controls for household and similar use	EN 60 730 –1
	Electromagnetic compatibility for industrial and domestic sector	Emissions: EN 60 730-1 Immunity: EN 60 730-1
	Degree of protection	IP30 to EN 60 529
	Pollution class	II (EN 60 730-1)
	Safety class: local regulations must be observed!	III (IEC 60536)
	General	Material
Dimensions (H x W x D)		30 x 95 x 93 mm (1.18 x 3.66 x 3.66 in)
Weight (including package)		231 g (8.1 oz.)

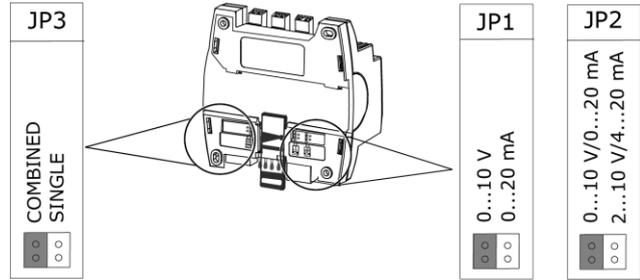
Wiring diagram



**Jumper 3 configuration
(only if IP09 = OFF)**

Combined mode: All relays can be on at the same time. If a switching condition is true the relay will switch on.

Single mode: Only one relays is switched on at a time. This mode is typically used to switch fan speeds.



Stage	JP3: Combined	JP3: Single
Stage 1	DO1	DO1
Stage 2	DO1+DO2	DO2
Stage 3	DO1 + DO2 + DO3	DO3

Installation

When mounting note the following:

- Mount in standard cabinet to DIN 43880
- Surface mount to top-hat rail to EN 60715 (DIN rail) or alternatively surface mount with 2 #4 screws
- A protective housing must be used if mounted outside an electrical cabinet
- Ensure adequate air circulation to dissipate heat generated during operation
- Observe local regulations
- Do not mount in a wet or condensation prone environment

See installation sheet no. 70-000603 (www.vectorcontrols.com).

Configuration

Limit the signal with parameters

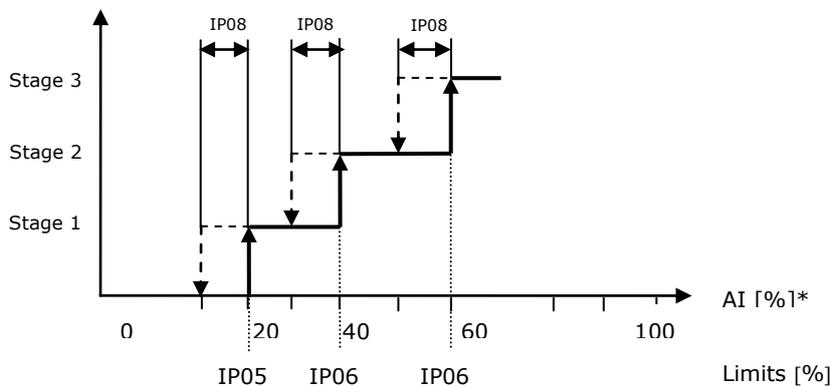
The working range of the input signal may be changed by setting the low and the high signal limits. JP2 only applies if parameters IP03 and IP04 are in their default settings of IP03 = 0% and IP04 = 100%. If these settings are changed, (e.g. IP3 = 20% and IP04 = 70%). The signal level below IP03 will be reported as 0% and above IP04 as 100%. The signal in between those settings is spanned.

Use as controller

In combination with a transmitter, the AER-D13 may be used to start a fan or open a valve. Thus a simple and low cost on/off control is possible. The activation level defined in IP05-IP07 is in this case the set point. The hysteresis defines the control accuracy and switching frequency.

Applications can be for example the control of dehumidifiers with a humidity transmitter, cooling compressors with a temperature transmitter and outside dampers with a CO2 or VOC sensor.

Switching mode if IP09 = OFF



Description

- IP05: Activation limit stage 1
- IP06: Activation limit stage 2
- IP07: Activation limit stage 3
- IP08: Hysteresis

Switching mode if IP09 = ON

While IP09 = ON, the parameter defined switching on limits will be deactivated. Instead preset limits apply. The switching hysteresis defines the difference of the input signal required to switch on and off one stage. Actual switching off limit for each stage is the below defined limit - ½ hysteresis. The switching on limit is the below defined limit + ½ hysteresis. For example a hysteresis of 10% will result in switching off limit of 7.5% for stage 1 and switching on of 17.5%. (Difference of 10%).

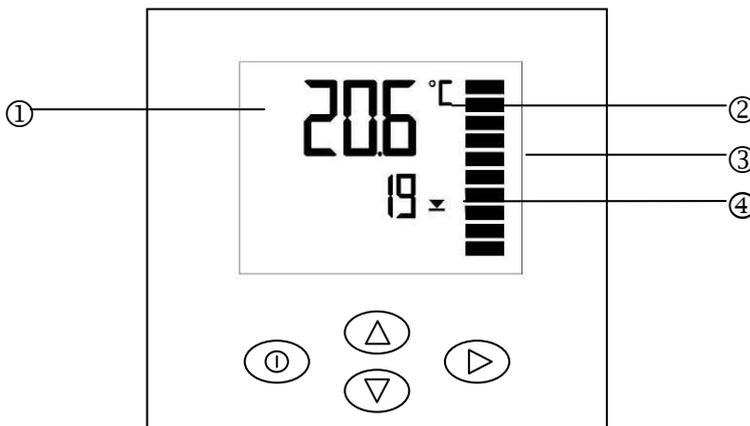
Stage	Limit	DO1	DO2	DO3
OFF	0%	OFF	OFF	OFF
Stage 1	12.5%	ON	OFF	OFF
Stage 2	25.0%	OFF	ON	OFF
Stage 3	37.5%	ON	ON	OFF
Stage 4	50.0%	OFF	OFF	ON
Stage 5	62.5%	ON	OFF	ON
Stage 6	75.0%	OFF	ON	ON
Stage 7	87.5%	ON	ON	ON

Note: Jumper 3 will be disabled while IP09 = ON.

Using the operation terminal

The parameters can be configured with the OPA-S or OPU-S by plugging it into the corresponding port on the AER-D13. Additionally the input value or error messages may be shown and min/max values observed.

Display and keys for OPA-S



Legend:

1. 4-digit display of current value, Minimum, Maximum or control parameter
2. Unit of displayed value, °C, °F, % or none
3. Graphical display of output or input signal with a resolution of 10%
4. 4-digit display of current value or control parameter

Operation keys:

- ⊖ LEFT key: Exit from parameter menu
- △ UP key: Display maximum values, Press for more than 2 seconds resets maximum value
- ▽ DOWN key: Display minimum values, Press for more than 2 seconds resets minimum value
- ▷ RIGHT key: Select transmitter, For transmitters with more than one input.

Error messages

Following error condition may be displayed:

- Err1:** Communication time out between terminal unit and transmitter. Terminal unit will reset after 10 seconds.
- Err3:** The signal is set to 2-10V or 4-20mA and the input voltage is less than 1.5V or 3mA.

Configuration parameters

The AER-D13 can be adapted to fit perfectly into your application by adjusting the switching limits and if required the input signal range. This way several AER-D13 may be connected to one VDC output signal.

The parameters are set with the operation terminals OPA-S or OPU-S. These operation terminals may also be used as remote indicator.

For correct display version 1.4 of OPA-S is required.

Changing of parameters

Login to the controller as follows:

1. Press UP/DOWN buttons simultaneously for three seconds.
2. CODE is shown on the upper digits.
3. Select 009 using UP/DOWN buttons.
4. Press Right key after selecting the correct code. IP is shown on the upper digits
5. Press Right key to enter IP setting
6. Select the parameters by pressing the UP/DOWN buttons. The parameter name is shown in the small digits.
7. Press Right key to select parameter. 2 Arrows will appear right from the parameter name. Press UP/Down key to adjust value.
8. Press Right key to save value
9. Leave configuration menu by pressing 2 times LEFT key

Parameters

Parameter	Description	Range	Default
IP 00	Show percent sign for value	ON/OFF	ON
IP 01	Samples taken for averaging control signal. A large number slows the reaction to a quick change in the input signal.	0...255	1
IP 02	Calibration	-10.0...+10.0	0.0
IP 03	Input signal lower limit (* ¹)	0...100%	0%
IP 04	Input signal upper limit(* ¹)	0...100%	100%
IP 05	Switch on limit for stage 1	0...100%	25%
IP 06	Switch on limit for stage 2	0...100%	50%
IP 07	Switch on limit for stage 3	0...100%	80%
IP 08	Switching hysteresis. If IP09 = OFF: Switch off limit = Switch on limit – hysteresis If IP09 = ON: Switch on limit = limit + ½ hysteresis Switch off limit = limit – ½ hysteresis	0...100%	10%
IP 09	New with V1.1 Use binary mode instead of 3 switching levels. (* ²) In binary mode a total of 7 switching positions are possible. Note: JP3, IP05 to IP 07 do not apply if this parameter is set to ON.	ON/OFF	OFF

(*¹) Note: JP2 will be ignored if IP03 ≠ 0% or IP04 ≠ 100%

(*²) Note: JP3, IP05 to IP 07 do not apply if this parameter is set to ON.