Intrinsically Safe Galvanic Isolators A3-UNIT Series

CURRENT LOOP SUPPLY
(HART communication)

Functions & Features
• Powers a 4 – 20 mA DC current loop
• Isolated intrinsically safe associated apparatus: no need of grounding
• Isolates and relays HART signals bidirectionally
• Shortcircuit protection
• Power LED

Typical Applications
• 2-wire HART transmitters


ORDERING INFORMATION
• Code number: A3DYH-[1]A-R
Specify a code from below for [1].
(e.g.: A3DYH-0A-R)
For the safety approval code 2, specify the product’s destination country using Ordering Information Sheet (No. ESU-5971).

[1] SAFETY APPROVAL
0: None
1: FM intrinsically safe
2: CENELEC intrinsic safety (ATEX)

INPUT
Current
4 – 20 mA DC

OUTPUT
Current
A: 4 – 20 mA DC

POWER INPUT
DC Power
R: 24 V DC
(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

GENERAL SPECIFICATIONS
Construction: Stand-alone; terminal access at the front
Connection: Euro type connector terminal
(applicable wire size: 0.2 to 2.5 mm², stripped length: 8 mm)
Housing material: Flame-resistant resin (gray)
Isolation: Input to output to power
Overrange output: Approx. -10 to +110 %
Zero adjustment: -2 to +2 % (front)
Span adjustment: 98 to 102 % (front)
Power indicator LED: Green LED turns on while the power is supplied.

SUPPLY OUTPUT
■ SUPPLY OUTPUT (across the terminals 1 – 2, 4 – 5)
Output voltage: Approx. 22 V DC with no load 14 V DC minimum at 20 mA.
A loop-powered device (e.g. indicator) through which the A3DYH supplies excitation voltage to a two-wire transmitter causes a certain voltage drop. Be sure that the voltage after the drop remains within the transmitter’s operating range.
Current rating: ≤ 22 mA DC
• Shortcircuit Protection
Current limited: 30 mA max.
Protected time duration: No limit

INPUT SPECIFICATIONS
■ INPUT: Input resistor incorporated.
Approx. 330Ω as two-wire transmitter excitation supply; approx. 45 Ω as isolator with 4 – 20 mA input

OUTPUT SPECIFICATIONS
■ LOAD RESISTANCE: 550 Ω max. (230 min. required for HART communication)

HART COMMUNICATION
Frequency band: 500 Hz – 5 kHz (within -3 dB)
Communication directions: Bidirectional

INSTALLATION
Power consumption
• DC: Approx. 3 W
Operating temperature: -5 to +55°C (23 to 131°F)
Operating humidity: 0 to 95 %RH (non-condensing)
Mounting: DIN rail
Weight: 130 g (0.29 lb)

**PERFORMANCE in percentage of span**

- **Accuracy:** ±0.1%
- **Temp. coefficient:** ±0.015 %/°C (±0.008 %/°F)
- **Response time:** ≤ 0.1 sec. (0 - 90 %)
- **Line voltage effect:** ±0.1 % over voltage range
- **Insulation resistance:** ≥ 100 MΩ with 500 V DC
- **Dielectric strength:** 1500 V AC @ 1 minute
  (input to output or power to ground)
  500 V AC @ 1 minute (output to power)

**STANDARDS & APPROVALS**

Refer to the manuals to comply with the standards.

**EU conformity:**
ATEX Directive (for ATEX intrinsic safety)
  Ex ia EN 60079-11
EMC Directive
  EMI EN 61000-6-4
  EMS EN 61000-6-2
RoHS Directive
  EN 50581

**Safety approval:**
FM: Intrinsically safe associated apparatus
  Class I, Div. 1, Groups A, B, C and D
  Class II, Div. 1, Groups E, F and G
  Class III, Div. 1
  Class I, Zone 0, [AEx ia] IIC
    (Class 3600)
    (Class 3610)
  (ANSI/ISA 60079-0)
  (ANSI/ISA 60079-11)

CENELEC: Intrinsic safety associated apparatus (ATEX)
  II (1) G, [Ex ia Ga] IIC
    (EN 60079-0)
    (EN 60079-11)
### HART COMMUNICATION

**CENELEC (ATEX)**

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>Voltages, Currents and Powers</th>
<th>Group</th>
<th>C (μF)</th>
<th>L (mH)</th>
<th>L / R (μH / Ω)</th>
<th>C (μF)</th>
<th>L (μH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or 4 to 2, 3 or 5</td>
<td>Uo = 26.25V, Io = 88.4mA, Po = 580mW</td>
<td>IIC</td>
<td>0.075</td>
<td>2.2</td>
<td>30</td>
<td>----</td>
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<tr>
<td></td>
<td></td>
<td>IIB</td>
<td>0.650</td>
<td>16.2</td>
<td>220</td>
<td>----</td>
<td>----</td>
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<tr>
<td></td>
<td></td>
<td>IIA</td>
<td>2.150</td>
<td>28.0</td>
<td>378</td>
<td>----</td>
<td>----</td>
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<tr>
<td>2 or 5 to 3</td>
<td>Uo = 1.1V, Io = 45mA, Po = 13mW</td>
<td>IIC, IIB or IIA</td>
<td>100</td>
<td>17.5</td>
<td>----</td>
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</tr>
<tr>
<td>7 to 8 and 11 to 12</td>
<td>Um = 250Vrms</td>
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</table>

**FM**

<table>
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<tr>
<th>Terminal No.</th>
<th>Voltages, Currents and Powers</th>
<th>Group (NEC 500)</th>
<th>Group (NEC 505)</th>
<th>C (μF)</th>
<th>L (mH)</th>
<th>L / R (μH / Ω)</th>
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<tbody>
<tr>
<td>1 or 4 to 2, 3 or 5</td>
<td>Voc (Uo) = 275V, Isc (Io) = 93mA, Po = 640mW</td>
<td>A or B</td>
<td>IIC</td>
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<td>54</td>
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<td></td>
<td></td>
<td>C or E</td>
<td>IIB</td>
<td>0.65</td>
<td>16.2</td>
<td>220</td>
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<td>D, F or G</td>
<td>IIA</td>
<td>2.15</td>
<td>32.5</td>
<td>442</td>
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<tr>
<td>2 or 5 to 3</td>
<td>Voc (Uo) = 1.1V, Isc (Io) = 45mA, Po = 13mW</td>
<td>A, B, C, D</td>
<td>IIC, IIB or IIA</td>
<td>100</td>
<td>18</td>
<td>----</td>
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<tr>
<td>7 to 8 and 11 to 12</td>
<td>Um = 250Vrms</td>
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### EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS

Unit: mm (inch)

- When mounting, no extra space is needed between units.
Specifications are subject to change without notice.