### Analog Input Module Specifications

| Model Number | 3704E | 3720 | 3721 |
|---|---|---|---|
| Voltage | 0-5V or 0-10V[a], + 6% | 0-5VDC, + 6% | 0 to 5 VDC or -5 to +5 VDC[a], + 6% |
| Type | TMR, AI | TMR, AI | TMR, AI |
| No. of Input Points | 64, commoned | 64, single-ended | 32 differential, DC-coupled |
| Isolated Points | No | Yes | Yes |
| Input Update Rate | 75 ms | 10 ms | 10 ms |
| Resolution | 12 bits | 12 bits or 14 bits programmable | 12 bits or 14 bits programmable |
| Accuracy | < 0.25% of FSR from 0° to 60° C | < 0.15% of FSR from 0° to 60° C | < 0.15% of FSR from 0° to 60° C |
| Input Resistance (load) | 30 MΩ (DC), min. | 10 MΩ (DC), min. | 10 MΩ (DC), min. |
| Power-Off Resistance | 30 kΩ (DC), typical | 140 kΩ (DC), typical | 140 kΩ (DC), typical |
| Common Mode Rejection | n/a | n/a | -85 dB (DC - 100 Hz) |
| Common Mode Range | n/a | n/a | -12V to +12V peak |
| Leg-to-Leg Isolation | 200 kΩ, typical | 420 kΩ, typical | 420 kΩ, typical |
| Normal Mode Rejection | -1 dB @ 8Hz<br>-12 dB @ 60Hz<br>-18 dB @ 120Hz | -3 dB @ 8Hz<br>-17 dB @ 60Hz<br>-23 dB @ 120Hz | -3 dB @ 23 Hz<br>-8 dB @ 60 Hz<br>-14 dB @ 120 Hz |
| Input Overrange Protection | 150 VDC/115 VAC continuous | 150 VDC/115 VAC continuous | 150 VDC/115 VAC continuous |
| Current Range | 0-20 mA,<br>250 Ω shunt for 5V<br>500 Ω shunt for 10V | 0-20 mA (plus 6% over-range) with 250 Ω shunt resistor | 0-20 mA with 250 Ω shunt resistor |
| Diagnostic Indicators | | | |
| Module Status | PASS, FAULT, ACTIVE | PASS, FAULT, ACTIVE, FIELD | PASS, FAULT, ACTIVE, FIELD |
| Color Code | Copper | Yellow | Yellow |

a. The voltage is selected using the TriStation 1131 software.

## Analog Output Modules

Analog Output (AO) modules receive output signals from the Main Processor module on each of three channels. Each set of data is then voted and a healthy channel is selected to drive the outputs. Each module monitors its own current outputs (as input voltages) and maintains an internal voltage reference to provide self-calibration and module health information.

Each channel on a module has a current loopback circuit which verifies the accuracy and presence of analog signals independently of load presence or channel selection. The module's design prevents a non-selected channel from driving an analog signal to the field. In addition, ongoing diagnostics are performed on each channel and circuit of the module. Failure of any diagnostic test deactivates the faulty channel and activates the Fault indicator and the chassis alarm. The module Fault indicator merely indicates a channel fault, not a module failure. The module continues to operate properly with as many as two channels failed. Open loop detection is provided by a LOAD indicator which activates if the module is unable to drive current to one or more outputs.

The module provides for redundant loop power sources with individual power and fuse indicators called PWR1 and PWR2. External loop power supplies for analog outputs must be provided by the user. A LOAD indicator activates if an open loop is detected on one or more output points. PWR1 and PWR2 are on if loop power is present.

AO modules support hot- spare capability, which allows online replacement of a faulty module.

AO modules require a separate external termination panel (ETP) with a cable interface to the Tricon controller backplane. Each module is mechanically keyed to prevent improper installation in a configured chassis.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3674 | Dual DO, 24 VDC, self-protected, 32 pts. | 9662-610F | n/a | 9653-610F | 9671-610F | n/a | 9101-010F | n/a | 9671-810F[b] |
| **Module Model #** | **Module Description** | **Commoned Term Panels** | **Non-Common. Term Panels** | **Basic Term Panels** | **Nonincendive Term Panels** | **RG 1.180 Term Panels** | **Fanned-out Cables** | **Bypass Panels** | **ERT Loop-Back Cables/Panels** |
| 3805E<br>3805H | AO, 4–20 mA, 8 pts. | n/a | n/a | 9853-610F | 9861-610F | 9860-610F | n/a | n/a | n/a |
| 2870H | AO HART Interface | n/a | n/a | 9853-610F | 9861-610F | 9860-610F | n/a | n/a | n/a |
| 3806E | AO, 6 4–20 mA outputs,<br>2 20–320 mA outputs | n/a | n/a | 9863-710F (special panel) | n/a | n/a | n/a | n/a | n/a |
| 3807 | AO, 4 bipolar -60 to 60 mA outputs | 9881-810F | n/a | n/a | 9871-810F | n/a | n/a | n/a | n/a |
| **Module Model #** | **Module Description** | **Upscale** | **Downscale** | **Basic Term Panels** | **Nonincendive Term Panels** | **RG 1.180 Term Panels** | **Fanned-out Cables** | **Bypass Panels** | **ERT Loop-Back Cables/Panels** |
| 3706A | Thermocouple input, type J, K, T, differential, 32 pts. | 9766-210F | 9766-510F | n/a | 9784-610F, upscale<br>9785-610F, downscale | n/a | n/a | n/a | n/a |
| 3708E | Thermocouple input, type E, J, K, T, isolated, 16 pts. | 9765-610F | 9765-610F | n/a | 9786-110F | 9782-110F | n/a | n/a | n/a |
| **Module Model #** | **Module Description** | **3-Wire 4-20 mA** | **Voltage** | **2-Wire 4-20 mA** | **Nonincendive Term Panels** | **RG 1.180 Term Panels** | **Basic** | | **RTD/TC/AI** |
| 3700<br>3700A | AI, 0–5 VDC, differential, 32 pts. | n/a | 9763-810F | 9761-210F, 0–5 V<br>9771-210F, 0–5 V | 9791-610F, current input<br>9787-110F, voltage input | 9790-610F, current input<br>9792-610F, 4-20 mA, 0-5 V, 16 VDC-56 VDC field<br>9783-110F, voltage input<br>9764-310F, RTD/TC/AI input[c] | 9753-110F, 0–5 V | | 9764-310F[c] |
| 2770H | AI HART Interface | n/a | n/a | 9761-210F, 0–5 V<br>9771-210F, 0–5 V | 9791-610F, current input | 9790-610F, current input | n/a | | n/a |
| 3701 | AI, 0–10 VDC, differential, 32 pts. | n/a | 9763-810F | 9761-410F | n/a | n/a | 9753-110F, 0–10 V | | n/a |
| 3703E[d] | AI, 0–5/0–10 VDC, isolated, 16 pts. | n/a | 9763-810F | 9762-210F, 0–5 V<br>9762-410F, 0–10 V<br>9771-210F, 0-5 V | 9791-610F, current input<br>9787-110F, voltage input | 9790-610F, 4–20 mA, 0–5 V<br>9792-610F, 4-20 mA, 0-5 V, 16 VDC-56 VDC field<br>9795-610F, 4–20 mA, 0–10 V<br>9783-110F, voltage input | 9753-110F, 0–5/0–10 V | | n/a |
| 3704E[d] | AI, 0–5/0–10 VDC, non-isolated, 64 pts. | 9765-210F, 0–5V | n/a | 9760-210F, 0–5 V<br>9760-410F, 0–10 V | 9789-610F, 4–20 mA | n/a | 9750-210F, 4–20 mA<br>9750-810F, 0–5/0–10 V | | n/a |
| 3720 | AI, 0–5 VDC, single-ended, 64 pts. | 9765-210F, 0–5 V | n/a | 9760-210F, 0–5 V | 9789-610F, 4–20 mA | n/a | 9750-210F, 4–20 mA<br>9750-810F, 0–5 V | | n/a |
| 3721[d] | AI, 0 to 5 VDC or –5 to +5 VDC, differential, 32 pts. | n/a | 9763-810F | 9761-210F, 0–5 V<br>9761-410F, 0–10 V<br>9771-210F, 0–5 V | 9791-610F, current input<br>9787-110F, voltage input | 9790-610F, 4–20 mA, 0–5 V<br>9792-610F, 4-20 mA, 0-5 V, 16 VDC-56 VDC field<br>9795-610F, 4–20 mA, 0–10 V<br>9783-110F, voltage input<br>9764-310F, RTD/TC/AI input[c] | 9753-110F, 0–5 V | | 9764-310F[c] |

a. Point blown-fuse indicator will not illuminate when point fuse is removed. Each point is commoned.

b. Point blown-fuse indicator will not illuminate when point fuse is removed. Each point is self-protected and commoned.

c. Signal conditioners must be ordered separately. A total of 16 is required for each termination panel.

d. Must be configured using the TriStation 1131 software.