

**MANUAL ADDENDUM FOR M701H  
ZERO AIR MODULE  
WITH INTERNAL DEWPOINT  
SENSOR**

**ADDENDUM TO M701 MANUAL (P/N 016710)**

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The M701H is an upgraded version of the M701 zero air generator. It features:

- Increased operating pressure (although lower efficiency), 50 psig
- Lower dewpoint over much of this range,  $< -25^{\circ}\text{C}$  at 20 SLPM.
- An optional configuration (part of the delivered unit) includes a fixed restrictor in the output port to limit flow to 20 SLPM at 30 psig, ultra-low output of low-molecular weight hydrocarbons, and an indicator to signal when the output dewpoint exceeds minus  $16^{\circ}\text{C}$  ( $\geq -16^{\circ}\text{C}$ ).

Tidbits:

- PSA regeneration drier has its shuttle valve integrated into its header.
- Pump is longer-stroke version of the standard Thomas pump.
- New control board with new micro-controller, which has a 10-bit A/D converter, a 12-bit DAC, and a dewpoint sensor. Firmware written in C. Power supply on board provides +5 and +12V.
- There are two LED indicators (“<” and “>”) on the front panel that indicate when the output dewpoint exceeds  $-16^{\circ}\text{C}$ . Please see Table 1 for a description of the behavior of the LEDs.

**Table 1: Behavior of LEDs**

Situation	Green (“<”) LED	Red (“>”) LED
Power-up of the M701	Off	Flash twice pause, then repeat for 120 seconds
Dew Point over $-16^{\circ}\text{C}$	Off	Flash continuously
Dew point less than $-16^{\circ}\text{C}$	On	Off

- All of the fittings downstream of the hydrocarbon scrubber are stainless and a special gasket in the outlet filter is installed to minimize low-molecular weight hydrocarbon contamination in the output gas. This allows the M701H to be used as a source of burner air for instruments that have a FID as their detector.
- There is a 0.035” diameter restrictor in the outlet fitting of the zero air generator that limits the flow rate to 20 SLPM at 30 PSIG (on the front panel). This insures that there is always backpressure on the regenerative drier even if the outlet of the generator is left completely unrestricted making the generator’s operation more user-friendly.

Approximately one lpm of the M701H's output is bled through the dewpoint sensor. A 10-24 fitting on the exhaust of the sensor can be used to check bleed flow and to verify the sensor's performance (see Table 2: Status/Signal Output Connector Functions)

**Table 2: Status/Signal Output Connector Functions**

<b>PIN</b>	<b>Description</b>	<b>Comment</b>
1	Status Pull Up	2K resistor to internal +5V. Can be used as pull up current source for status output collector. This allows status output to be used without an external power supply
2	Status Output Collector	Collector of status output transistor. Conduct to emitter, pin 3 of connector when dewpoint measured by sensor is less than $-16^{\circ}\text{C}$
3	Status Output Emitter	Emitter of status output transistor. See pin 2
4	Digital Ground	Internal power supply digital ground. Can be used as return for Status Output Emitter (pin 3). This allows status output to be used without external power supply.
5	Analog Ground	Ground for Dewpoint out (pin 6)
6	Dewpoint Out	Analog (0.8V to 4V) signal that represents the dewpoint of the zero air output.

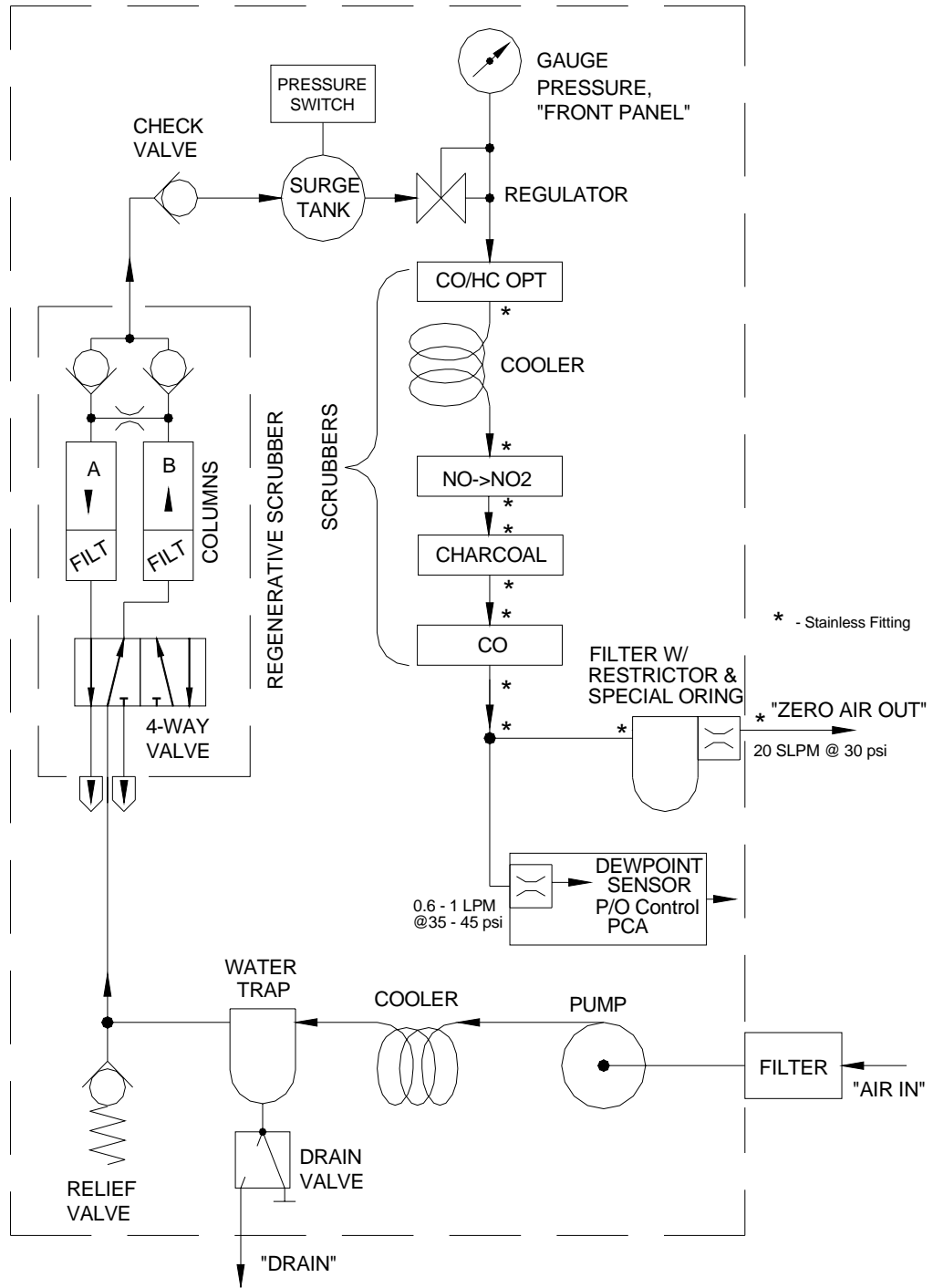


Figure 1: Pneumatic Diagram of M701H w/internal dewpoint sensor

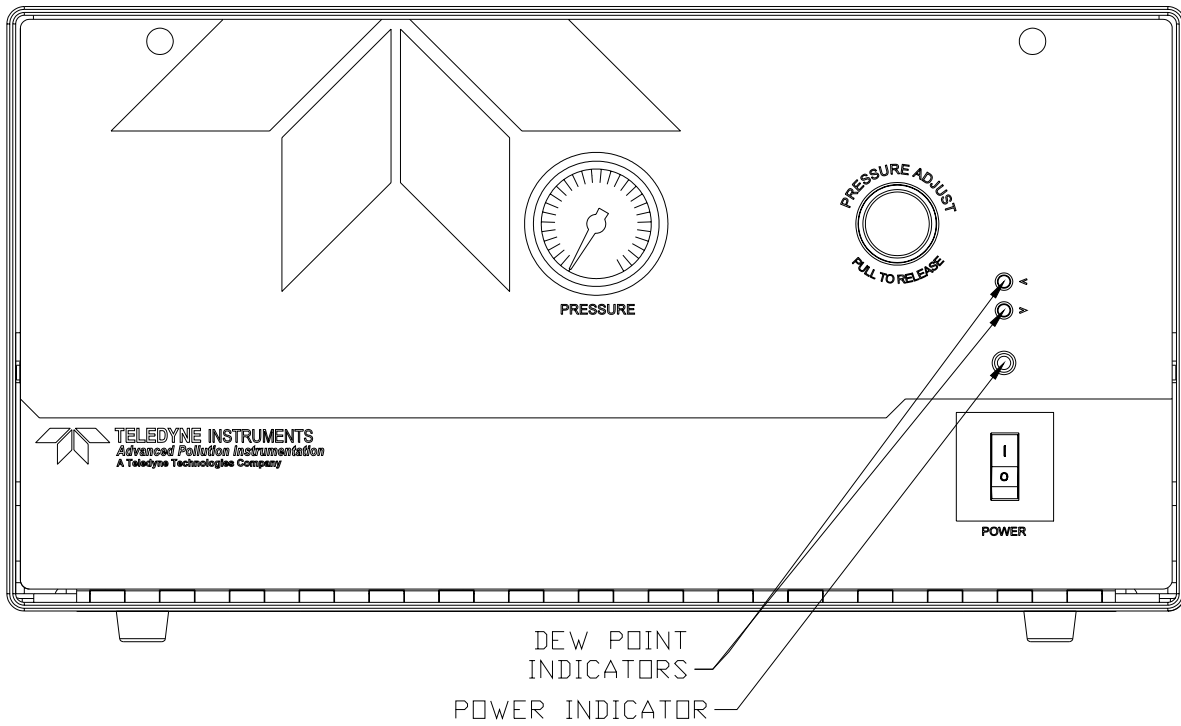


Figure 2: M701H w/Optional Dewpoint Indicator Front Panel

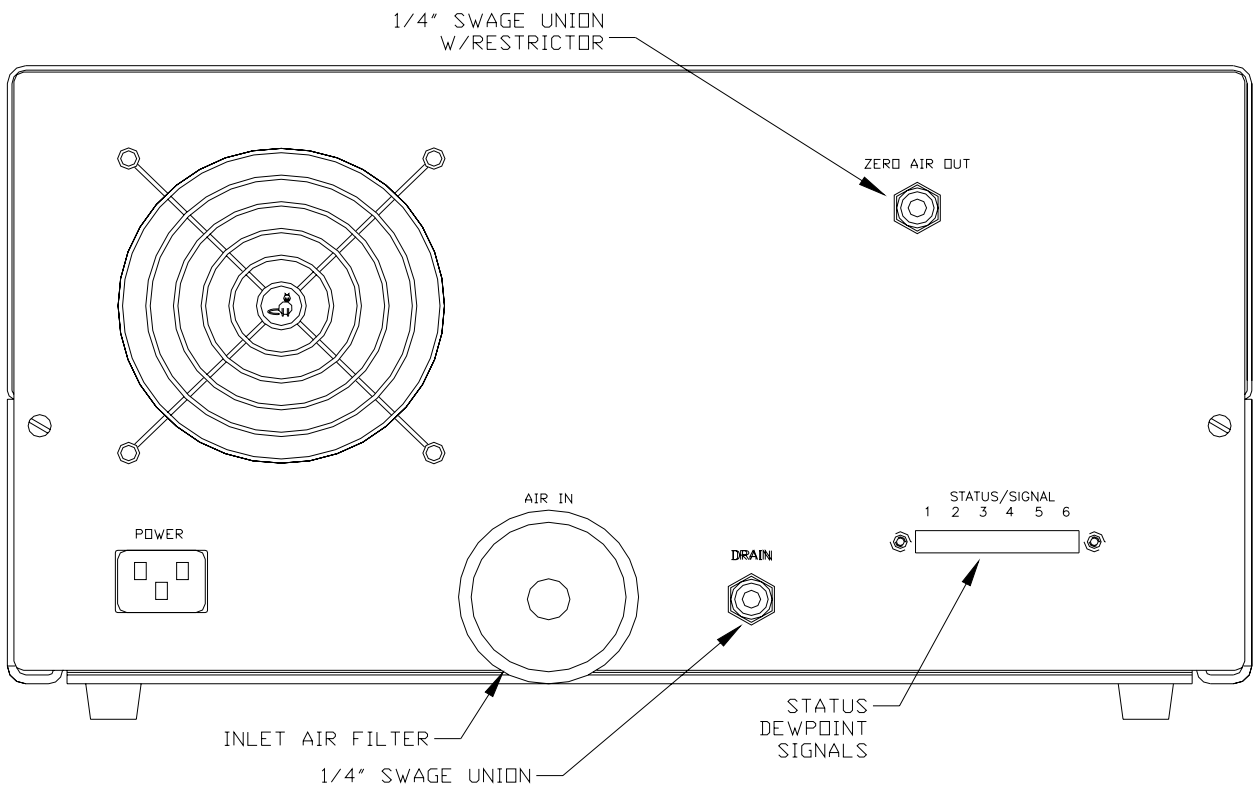
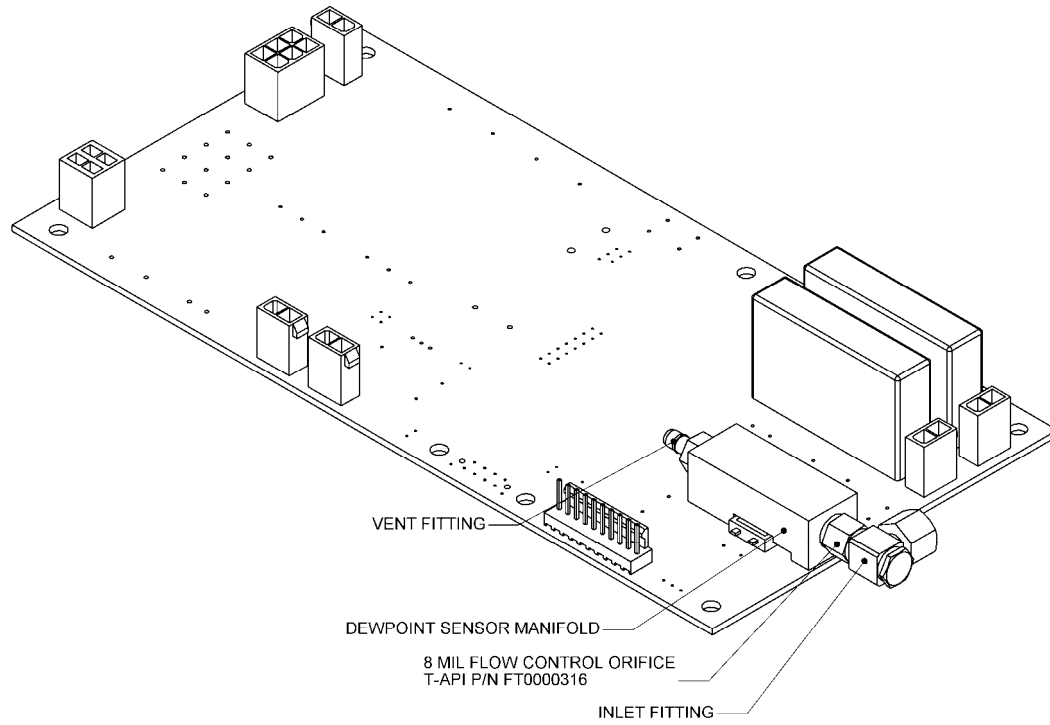


Figure 3: M701H w/Optional Dewpoint Indicator Rear Panel



**Figure 4: Control Board with Dewpoint Sensor**