

Air/Gas Ratio Alarm Device UAP1093

DESCRIPTION

Natural gas requires around 10 volumes of air per volume of gas for correct combustion.

If the ratio of combustion air flow to natural gas flow drops below a set ratio, unburnt combustibles may be present in the flue gas. For some burners, the ratio at which unburnt gas occur varies with the turndown of the burner. The aim is to prevent this condition from occurring by using the USC701 to monitor the ratio of air to gas flow and provide alarm and trip points if the ratio drops below a preset level.

The memories can be displayed on and access module using the keys shown in brackets.

CH1 4-20mA represents air flow (square law relationship) from a pressure transmitter (UP).

CH2 4-20mA represents gas flow (square law relationship) from another pressure transmitter ((DOWN).

M4 air flow = $a \times \sqrt{\frac{(CH1 - 4)}{16}}$ where a = max flow in Sm³/hr (UP + NEXT).

M5 gas flow = $b \times \sqrt{\frac{(CH2 - 4)}{16}}$ where b = max flow in Sm³/hr (DOWN + NEXT).

M6 air:gas = the air:gas ratio. This signal is sent to the analogue output for monitoring (BACK).

M7 M5table = the required trip ratio calculated by using a lookup table based on the gas flow (BACK+ NEXT).

Alarm points

M8 RY1alarm = 0 when M6 < M7 * 1.2. M8 = 0 will causes the trip alarm = RLY1 contact is opened
(delays can be set).

M9 RY2alarm = 0 when M6 < M7. M9 = 0 will causes the trip alarm = RLY2 contact is opened
(delays can be set).

Constants

a Sm³/hAIR = 8200. Used in formula above

b Sm³/hGAS = 600. Used in formula above

The "a" and "b" constants, relay time delays and the alarm lookup table can be changed using the COA703 and "USC Config 106".

The "a" and "b" constants and relay time delays can be changed using the AM702.