

## RHE2X I/O, Communication and Display Information

### 1. Current Output

#### Current Output Fire State

The current output fire state determines the behaviour and value of the analog output when the analog range is exceeded (setting “x mA - range exceeded only”) or a soft/hard error condition exists (setting “x mA – error condition exists only”). If “Clamp to range / Off” is activated the output tracks the signal and clamps at the minimum or maximum analog value when its range is exceeded.

### 2. Digital Outputs 1 & 2

The digital channels 1 & 2 output pulse or frequency. The pulse configuration is not intended to indicate a flow rate. When the digital output 1 or 2 is programmed to frequency the output frequency is scaled to mass or volume flow. Digital output 1 can be combined with output 2 for a 90° phase shifted output which can also be used to determine flow direction.

### 3. Digital Status 1 & 2

The digital status outputs 1 & 2 can be programmed to indicate various alarm states of RHE2X. Following alarm (high logic level) functions are available:

- Setpoint alarm - Alarm is indicated when the current measured value is higher than the upper alarm value and cleared when it returns below the lower alarm value.
- Inband alarm - Alarm is indicated when the current measured value is in the range between the lower and the upper alarm value.
- Outband alarm - Alarm is indicated when the current measured value is outside the range between the lower and the upper alarm value.

For all configurations, the digital status outputs are activated/closed when an alarm condition comes true.

By default digital status output 1 signals flow direction. An activated/closed state indicates negative flow.

By default digital status output 2 indicates error condition. It is activated/closed as long as there are no errors.

## 4. Digital Inputs 1 & 2

Functionalities of Digital Inputs 1 & 2:

- 1: Digital input causes the start of a zeroing process. Logic is positive – a transition to a high logic level starts the zeroing process.
- 2: Digital input causes the start of a zeroing process. Logic is negative – a transition to a low logic level starts the zeroing process.
- 3: Digital input causes reset of the totalizers and the start of batch process if configured. Logic is positive - a transition to a high logic level starts the batch process.
- 4: Digital input causes reset of the totalizers and the start of batch process if configured. Logic is negative - a transition to a low logic level starts the batch process.
- 5: A transition from low to high stops the totalizers when they are in the running state. A transition from high to low restarts the totalizers when they are in the stopped state.
- 6: A transition from high to low stops the totalizers when they are in the running state. A transition from low to high restarts the totalizers when they are in the stopped state.

## 5. Batch Mode

The automatic batch mode is used to automatically determining the amount of substance where the valve has to be switched off in order to obtain the target filling.

For this mode a digital input has to be used to reset the totalizers (configuration 3 or 4), please see section 4.

Digital status output 1 has to be configured to “Totalizer Mass Alarm” or “Totalizer Vol. Alarm”. The digital status output function controls the polarity of the output. The inband alarm function provides a transition from a high logic level to a low logic level when the target filling is reached. The outband alarm function provides a transition from a low logic level to a high logic level when the target filling is reached.

## 6. HART

The RHE2X transmitters feature up to two 4-20mA current outputs. The first current output labelled “1” may be equipped with a HART Modem when the RHE transmitter is ordered with the respective option.

The low-level protocol parameters such as the polling ID, the loop state and the number of preambles to send can be configured in the RHE2X transmitter.

PollingID: Adjustable in the range of 0 to 15. Default is 0.

Loop State: When set to 0 it disables the current loop and fixes it to 4mA. When set to 1 the loop is enabled and reflects the value of the assigned parameter. Default is 1.

Preambles: Characters to be used when a response telegram is transmitted in the range of 5 to 15. Default is 5.

## 7. Display/HMI

The backlighted LED display of the RHE2X transmitters can be configured to different modes and default screens.

- Default Screen: Specifies the content of the display which is shown permanently.
- Display Mode: 0 Namur: Use codes similar to the definition of the Namur standard: Red for “Severe Error”, blue for “Maintenance Required” due to configuration errors, yellow/orange for “Range Exceedance” either of the maximum ratings of of the user defined warning limits. White or off when no problem is found.
- 1 white only: This will show a white backlight when input buttons are pressed and switch off the backlight after a period of inactivity.
- 2 Assurance Factor: Use the Assurance Factor as control for the backlight display: Red when it gets smaller than 20%, blue from 20 to 50%, Amber for 50 to 70% and white/off greater than 70%. This feature only makes sense when the Assurance Factor Function is ordered.
- Backlight LED Timeout: The lighting duration of the display can be adjusted as follows:
- user defined time (default is 120 seconds)
  - permanently active
  - display lighted as long as a nonzero mass flow is present