Manual: Integral Mount or Remote Mount Magnetic Flowmeter System with FOUNDATION - Model 8732 - Section 3 Configuration an Section 4 Operation

Minera Las Bambas_Expanción de Planta de Molibdeno

Cliente Final: Minera Las Bambas

Número de Referencia Minera las Bambas:

Número de Referencia BECHTEL: 26211-000-V1A-JF08-00027

Nombre del archivo del documento: 26211-000-V1A-JF08-00027_0- Manual: Integral Mount or Remote Mount Magnetic Flowmeter System with FOUNDATION - Model 8732 - Section 3 Configuration an Section 4 Operation

Revisión: 0

Las Bambas Moly Plant EP

Job No 26211 Project

SELLER/CONTRACTOR DOCUMENT REVIEW

Permission to proceed does not constitute acceptance or approval of design detail, calculations, analysis, test methods, or materials developed or selected by Seller/Contractor, and does not relieve the Seller/Contractor from full compliance with contractual obligations

☐ 1 WORK MAY PROCEED, Editorial comments need only be incorporated if document revised and resubmitted

☐ 2 REVISE & RESUBMIT - WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES

☐ 3 REVISE & RESUMIT - WORK MAY NOT PROCEED

☒ 4 REVIEW NOT REQUIRED.WORK MAY PROCEED

REVIEWER: Jorge Moreno DATE:
DISCIPLINE: Control System & Instrum. DDR No:

PO / CONTRACT NO. Submittal: 002
Vendor no.
26211-000-MRA-JF08-00001
PROJECT DOCUMENT No.

Equipment Number (if applicable):

Autorización

	Nombre	Función	Firma
Desarrollado Por:	Roque Sialer	Administrador de Proyecto	CJ
Revisado Por:	Jose Salazar	Administrador de Proyecto	SJ
Emitido Por:	Warner Vega	Control de Documentos	WV

Distribución

Nombre	Compañía	Nombre	Compañía
Carlos Gutierrez Guarro	Bechtel	Roque Sialer	Emerson
David Cortes	Bechtel	Warner Vega	Emerson

Historial de Revisión

Rev.	Estado	Descripción	Fecha	Desarrollado por	Revisado por
A	Para Información	Primera Emisión	07-May-2019	Roque Sialer	Jose Salazar
0	Final	Segunda Emisión	04-Jun-2019	Roque Sialer	Jose Salazar

Emerson Process Management

Process Systems and Solutions

1100 W Louis Henna Blvd.–Building 1

Round Rock, TX 78681-7430 USA

T +1 (512) 832-3020

F +1 (512) 908-4177

www.EmersonProcess.com

Section 4 Operation

INTRODUCTION

This section contains information for advanced configuration parameters and diagnostics.

The software configuration settings for the Rosemount 8732 can be accessed through a 375 Field Communicator or through a control system. The software functions for the 375 Field Communicator are described in detail in this section of the manual. It provides an overview and summary of communicator functions. For more complete instructions, see the communicator manual. Before operating the Rosemount 8732 in an actual installation, you should review all of the factory set configuration data to ensure that they reflect the current application.

DIAGNOSTICS

375	Transducer Block

Diagnostics are used to verify that the transmitter is functioning properly, to assist in troubleshooting, to identify potential causes of error messages, and to verify the health of the transmitter and sensor. Diagnostic tests can be initiated through the use of a 375 Field Communicator or through the control system.

Rosemount offers several different diagnostic suites providing various functionality.

Standard diagnostics included with every Rosemount 8732 transmitter are Empty Pipe detection, Electronics Temperature monitoring, Coil Fault detection, and various loop and transmitter tests.

Advanced diagnostics suite option one (D01 option) contains advanced diagnostics for High Process Noise detection and Grounding and Wiring fault detection.

Advanced diagnostics suite option two (D02 option) contains advanced diagnostics for the 8714i Meter Verification. This diagnostic is used to verify the accuracy and performance of the magnetic flow meter installation.

Diagnostic Controls

375	Transducer Block, Diagnostics

The diagnostic controls menu provides a centralized location for enabling or disabling each of the diagnostics that are available. Note that for some diagnostics to be available, a diagnostics suite package is required.

Empty Pipe Detection

Turn the empty pipe diagnostic on or off as required by the application. For more details on the empty pipe diagnostic, see Appendix C: Diagnostics.

Electronics Temperature Out of Range

Turn the electronics temperature diagnostic on or off as required by the application. For more details on the electronics temperature diagnostic, see Appendix C: Diagnostics.

High Process Noise Detection

Turn the high process noise diagnostic on or off as required by the application. For more details on the high process noise diagnostic, see Appendix C: Diagnostics.

Grounding / Wiring Fault Detection

Turn the grounding / wiring diagnostic on or off as required by the application. For more details on the grounding / wiring diagnostic, see Appendix C: Diagnostics.

Basic Diagnostics

375	Transducer Block, Diagnostics

The basic diagnostics menu contains all of the standard diagnostics and tests that are available in the 8732E transmitter.

Empty Pipe Limits

375	Transducer Block, Diagnostics, Basic Diagnostics

Empty Pipe allows you to view the current value and configure the diagnostic parameters. For more detail on this parameter see Appendix C: Diagnostics.

EP Value

375	Transducer Block, Diagnostics, Basic Diagnostics, Empty Pipe Limits

Read the current Empty Pipe Value. This number is a unitless number and is calculated based on multiple installation and process variables. For more detail on this parameter see Appendix C: Diagnostics.

EP Trigger Level

375	Transducer Block, Diagnostics, Basic Diagnostics, Empty Pipe Limits

Limits: 3 to 2000

Configure the threshold limit that the empty pipe value must exceed before the diagnostic alert activates. Default from the factory is set to 100. For more detail on this parameter see Appendix C: Diagnostics.

EP Counts

375	Transducer Block, Diagnostics, Basic Diagnostics, Empty Pipe Limits

Limits: 5 to 50

Configure the number of consecutive times that the empty pipe value must exceed the empty pipe trigger level before the diagnostic alert activates. Counts are taken at 1.5 second intervals. Default from the factory is set to 5. For more detail on this parameter see Appendix C: Diagnostics.

Electronics Temp Value

375	Transducer Block, Diagnostics, Basic Diagnostics

Electronics Temperature allows you to view the current value for the electronics temperature.

Advanced Diagnostics

375	Transducer Block, Diagnostics

The advanced diagnostics menu contains information on all of the additional diagnostics and tests that are available in the 8732 transmitter if one of the diagnostics suite packages was ordered.

Rosemount offers two advanced diagnostic suites. Functionality under this menu will depend on which of these suites are ordered.

Advanced diagnostics suite option one (D01 option) contains advanced diagnostics for High Process Noise detection and Grounding and Wiring fault detection.

Advanced diagnostics suite option two (D02 option) contains advanced diagnostics for the 8714i Meter Verification. This diagnostic is used to verify the accuracy and performance of the magnetic flow meter installation.

8714i Meter Verification

375	Transducer Block, Diagnostics, Advanced Diagnostics

This diagnostic allows you to test and verify that the sensor, transmitter, or both are working within specifications. For more details on this diagnostic, see Appendix C: Diagnostics.

Run 8714i

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification

Run the meter verification test to check the transmitter, sensor, or entire installation.

Full Meter Verification
Run the internal meter verification to check the entire installation, sensor and transmitter at the same time.

Transmitter Only
Run the internal meter verification to check the transmitter only.

Sensor Only
Run the internal meter verification to check the sensor only.

8714i Results

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification

Review the results of the most recently performed 8714i Meter Verification test. Information in this section details the measurements taken and if the meter passed the verification test. For more details on these results and what they mean, see Appendix C: Diagnostics.

Test Condition

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results

Displays the conditions that the 8714i Meter Verification test was performed under. For more details on this parameter see Appendix C: Diagnostics.

Test Criteria

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results

Displays the criteria that the 8714i Meter Verification test was performed against. For more details on this parameter see Appendix C: Diagnostics.

8714i Result

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results

Displays the results of the 8714i Meter Verification test as pass or fail. For more details on this parameter see Appendix C: Diagnostics.

Simulated Velocity

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results

Displays the test velocity used to verify transmitter calibration. For more details on this parameter see Appendix C: Diagnostics.

Actual Velocity

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results

Displays the velocity measured by the transmitter during the transmitter calibration verification test. For more details on this parameter see Appendix C: Diagnostics.

Velocity Deviation

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results

Displays the deviation of the transmitter calibration verification test. For more details on this parameter see Appendix C: Diagnostics.

Transmitter Calibration Result

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results

Displays the result of the transmitter calibration verification test as pass or fail. For more details on this parameter see Appendix C: Diagnostics.

Sensor Calibration Deviation

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results

Displays the deviation of the sensor calibration verification test. For more details on this parameter see Appendix C: Diagnostics.

Sensor Calibration Result

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results**

Displays the result of the sensor calibration verification test as pass or fail. For more details on this parameter see Appendix C: Diagnostics.

Coil Circuit Result

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results**

Displays the result of the coil circuit test as pass or fail. For more details on this parameter see Appendix C: Diagnostics.

Electrode Circuit Result

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, 8714i Results**

Displays the result of the electrode circuit test as pass or fail. For more details on this parameter see Appendix C: Diagnostics.

Sensor Signature

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification**

The sensor signature describes the sensor characteristics to the transmitter and is an integral part of the sensor meter verification test. From this menu you can view the current stored signature, have the transmitter take and store the sensor signature, and re-call the last saved good values for the sensor signature. For more details on this parameter see Appendix C: Diagnostics.

Signature Values

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, Sensor Signature**

Review the current values stored for the sensor signature. For more details on this parameter see Appendix C: Diagnostics.

Coil Resistance

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, Sensor Signature, Signature Values**

View the reference value for the coil resistance taken during the sensor signature process.

Coil Signature

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, Sensor Signature, Signature Values**

View the reference value for the coil signature taken during the sensor signature process.

Electrode Resistance

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, Sensor Signature, Signature Values**

View the reference value for the electrode resistance taken during the sensor signature process.

Re-Signature Meter

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, Sensor Signature**

Have the transmitter measure and store the sensor signature values. These values will then be used as the baseline for the meter verification test. Use this when connecting to older Rosemount or competitors' sensors or installing the magnetic flowmeter system for the first time. For more details on this parameter see Appendix C: Diagnostics.

Recall Last Saved Values

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, Sensor Signature**

Recalls the last saved "good" values for the sensor signature.

Set Pass/Fail Criteria

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification**

Set the maximum allowable deviation percentage test criteria for the 8714i Meter Verification test. There are three tests that this criteria can be set for:

- Full Pipe; No Flow (Best test condition) – Default is 2%
- Full Pipe; Flowing – Default is 3%
- Empty Pipe – Default is 5%

NOTE
If the 8714i Meter Verification test is done with an empty pipe, the electrode circuit will NOT be tested.

No Flow Limit

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, Set Pass/Fail Criteria**

Limits: 1 to 10 percent

Set the pass/fail test criteria for the 8714i Meter Verification test at Full Pipe, No Flow conditions.

Flowing Limit

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, Set Pass/Fail Criteria**

Limits: 1 to 10 percent

Set the pass/fail test criteria for the 8714i Meter Verification test at Full Pipe, Flowing conditions.

Empty Pipe Limit

375	**Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, Set Pass/Fail Criteria**

Limits: 1 to 10 percent

Set the pass/fail test criteria for the 8714i Meter Verification test at Empty Pipe conditions.

Measurements

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification

View the measured values taken during the meter verification process. These values are compared to the signature values to determine if the test passes or fails. Values are shown for the Coil Resistance, Coil Signature, and Electrode Resistance.

Coil Resistance

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, measurements

View the measured value for the coil resistance taken during the meter verification test.

Coil Signature

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, measurements

View the measured value for the coil signature taken during the meter verification test.

Electrode Resistance

375	Transducer Block, Diagnostics, Advanced Diagnostics, 8714i Meter Verification, measurements

View the measured value for the electrode resistance taken during the meter verification test.

Licensing

375	Transducer Block, Diagnostics, Advanced Diagnostics

If a diagnostic suite was not ordered initially, advanced diagnostics can be licensed in the field. Access the licensing information from this menu. For more details on licensing, see Appendix C: Diagnostics.

License Status

375	Transducer Block, Diagnostics, Advanced Diagnostics, Licensing

Determine if a diagnostics suite has been licensed, and if so, which diagnostics are available for activation.

License Key

375	Transducer Block, Diagnostics, Advanced Diagnostics, Licensing

A license key is required to activate diagnostics in the field if the diagnostic suite was not initially ordered. This menu allows for gathering of necessary data to generate a license key and also the ability to enter the license key once it has been received.

Device ID

375	Transducer Block, Diagnostics, Advanced Diagnostics, Licensing, License Key

This function displays the Device ID and Software Revision for the transmitter. Both of these pieces of information are required to generate a license key.

License Key

375	Transducer Block, Diagnostics, Advanced Diagnostics, Licensing, License Key

Allows you to enter a license key to activate a diagnostic suite.

Diagnostic Variables

375	Transducer Block, Diagnostics

From this menu, all of the diagnostic variable values can be reviewed. This information can be used to get more information about the transmitter, sensor, and process, or to get more detail about an alert that may have activated.

Empty Pipe Value

375	Transducer Block, Diagnostics, Diagnostic Variables

Read the current value of the Empty Pipe parameter. This value will read zero if Empty Pipe is turned off.

Electronics Temperature

375	Transducer Block, Diagnostics, Diagnostic Variables

Read the current value of the Electronics Temperature.

Line Noise

375	Transducer Block, Diagnostics, Diagnostic Variables

Read the current value of the amplitude of AC line noise measured on the transmitter's electrode inputs. This value is used in the grounding / wiring diagnostic.

5Hz SNR

375	Transducer Block, Diagnostics, Diagnostic Variables

Read the current value of the signal to noise ratio at 5 Hz. For optimum performance, a value greater than 100 is preferred. Values less than 25 will cause the High Process Noise alert to activate.

37Hz SNR

375	Transducer Block, Diagnostics, Diagnostic Variables

Read the current value of the signal to noise ratio at 37.5 Hz. For optimum performance, a value greater than 100 is preferred. Values less than 25 will cause the High Process Noise alert to activate.

Signal Power

375	Transducer Block, Diagnostics, Diagnostic Variables

Read the current value of the velocity of the fluid through the sensor. Higher velocities result in greater signal power.

8714i Results

375	Transducer Block, Diagnostics, Diagnostic Variables

Review the results of the 8714i Meter Verification tests. For more details on these results and what they mean, see Appendix C: Diagnostics.

Test Condition

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the conditions that the 8714i Meter Verification test was performed under. For more details on this parameter see Appendix C: Diagnostics.

Test Criteria

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the criteria that the 8714i Meter Verification test was performed against. For more details on this parameter see Appendix C: Diagnostics.

8714i Result

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the results of the 8714i Meter Verification test as pass or fail. For more details on this parameter see Appendix C: Diagnostics.

Simulated Velocity

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the test velocity used to verify transmitter calibration. For more details on this parameter see Appendix C: Diagnostics.

Actual Velocity

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the velocity measured by the transmitter during the transmitter calibration verification test. For more details on this parameter see Appendix C: Diagnostics.

Velocity Deviation

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the deviation of the transmitter calibration verification test. For more details on this parameter see Appendix C: Diagnostics.

Transmitter Calibration Result

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the result of the transmitter calibration verification test as pass or fail. For more details on this parameter see Appendix C: Diagnostics.

Sensor Calibration Deviation

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the deviation of the sensor calibration verification test. For more details on this parameter see Appendix C: Diagnostics.

Sensor Calibration Result

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the result of the sensor calibration verification test as pass or fail. For more details on this parameter see Appendix C: Diagnostics.

Coil Circuit Result

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the result of the coil circuit test as pass or fail. For more details on this parameter see Appendix C: Diagnostics.

Electrode Circuit Result

375	Transducer Block, Diagnostics, Diagnostic Variables, 8714i Results

Displays the result of the electrode circuit test as pass or fail. For more details on this parameter see Appendix C: Diagnostics.

Trims

375	Transducer Block, Diagnostics

Trims are used to calibrate the analog loop, calibrate the transmitter, re-zero the transmitter, and calibrate the transmitter with another manufacturer’s sensor. Proceed with caution whenever performing a trim function.

Electronics Trim

375	Transducer Block, Diagnostics, Trims

Electronics trim is the function by which the factory calibrates the transmitter. This procedure is rarely needed by customers. It is only necessary if you suspect the Rosemount 8732E is no longer accurate. A Rosemount 8714 Calibration Standard is required to complete a digital trim. Attempting an Electronics trim without a Rosemount 8714 Calibration Standard may result in an inaccurate transmitter or an error message. Electronics trim must be performed only with the coil drive mode set to 5 Hz and with a nominal sensor calibration number stored in the memory.

NOTE
Attempting an Electronics trim without a Rosemount 8714 may result in an inaccurate transmitter, or a “DIGITAL TRIM FAILURE” message may appear. If this message occurs, no values were changed in the transmitter. Simply power down the Rosemount 8732E to clear the message.

To simulate a nominal sensor with the Rosemount 8714, you must change the following five parameters in the Rosemount 8732E:

1. Sensor Calibration Number—1000015010000000
2. Units—ft/s
3. PV URV—AI EU at 100 = 30.00 ft/s
4. PV LRV—AI EU at 0 = 0 ft/s
5. Coil Drive Frequency—5 Hz

The instructions for changing the Sensor Calibration Number, Units, PV URV, and PV LRV are located in “Basic Setup” on page 3-14. Instructions for changing the Coil Drive Frequency can be found on page 4-12 in this section.

Set the loop to manual, if necessary, before you begin. Complete the following steps:

1. Power down the transmitter.
2. Connect the transmitter to a Rosemount 8714 sensor simulator.
3. Power up the transmitter with the Rosemount 8714 connected and read the flow rate. The electronics need about a 5-minute warm-up time to stabilize.
4. Set the 8714 calibrator to the 30 ft/s setting.
5. The flow rate reading after warm-up should be between 29.97 and 30.03 ft/s.
6. If the reading is within the range, return the transmitter to the original configuration parameters.
7. If the reading is not within this range, initiate a digital trim with the Handheld Communicator. The digital trim takes about 90 seconds to complete. No transmitter adjustments are required.

Auto Zero

375	Transducer Block, Diagnostics, Trims

The auto zero function initializes the transmitter for use with the 37 Hz coil drive mode only. Run this function only with the transmitter and sensor installed in the process. The sensor must be filled with process fluid at zero flow. Before running the auto zero function, be sure the coil drive mode is set to 37 Hz (Auto Zero will not run with the coil drive frequency set at 5 Hz).

Set the loop to manual if necessary and begin the auto zero procedure. The transmitter completes the procedure automatically in about 90 seconds. A symbol appears in the lower right-hand corner of the display to indicate that the procedure is running.

Universal Trim

375	Transducer Block, Diagnostics, Trims

The universal auto trim function enables the Rosemount 8732E to calibrate sensors that were not calibrated at the Rosemount factory. The function is activated as one step in a procedure known as in-process calibration. If your Rosemount sensor has a 16-digit calibration number, in-process calibration is not required. If it does not, or if your sensor is made by another manufacturer, complete the following steps for in-process calibration.

1. Determine the flow rate of the process fluid in the sensor.

NOTE
The flow rate in the line can be determined by using another sensor in the line, by counting the revolutions of a centrifugal pump, or by performing a bucket test to determine how fast a given volume is filled by the process fluid.

2. Complete the universal auto trim function.
3. When the routine is completed, the sensor is ready for use.

Status

375	Transducer Block, Diagnostics

Review status information regarding the operation of the transducer block. This is where additional information can be reviewed regarding transmitter health and diagnostic messages.

ADVANCED CONFIGURATION

In addition to the basic configuration options and the diagnostic information and controls, the 8732 has many advanced functions that can also be configured as required by the application.

DETAILED SETUP

375	Transducer Block

The detailed setup function provides access to other parameters within the transmitter that can be configured such as coil drive frequency, output parameters, local display configuration, and other general information about the device.

Additional Parameters

375	Transducer Block, Detailed Setup

The additional parameters menu provides a means to configure optional parameters within the 8732E transmitter.

Coil Drive Frequency

375	Transducer Block, Detailed Setup, Additional Params

Coil drive frequency allows pulse-rate selection of the sensor coils.

5 Hz
The standard coil drive frequency is 5 Hz, which is sufficient for nearly all applications.

37 Hz
If the process fluid causes a noisy or unstable output, increase the coil drive frequency to 37 Hz. If the 37 Hz mode is selected, perform the auto zero function.

Density Value

375	Transducer Block, Detailed Setup, Additional Params

The density value is used to convert from a volumetric flow rate to a mass flow rate using the following equation:

$Q_m = Q_v \times \rho$

Where:

Q_m is the mass flow rate

Q_v is the volumetric flow rate, and

ρ is the fluid density

NOTE
A density value is required to configure the flow units for mass flow rate measurement.

Sensor Range: EU at 100%

375	Transducer Block, Detailed Setup, Additional Params

This parameter is the maximum value that the PV Range value can be set to. This is the upper measuring limit of the transmitter and sensor.

Sensor Range: EU at 0%

375	Transducer Block, Detailed Setup, Additional Params

This parameter is the minimum value that the PV Range value can be set to. This is the lower measuring limit of the transmitter and sensor.

Cal Min Span

375	Transducer Block, Detailed Setup, Additional Params

The PV minimum span is the minimum flow range that must separate the minimum and maximum configured PV Range values.

Reverse Flow

375	Transducer Block, Detailed Setup, Additional Params

Enable or disable the transmitter's ability to read reverse flow.

Reverse Flow allows the transmitter to read negative flow. This may occur when flow in the pipe is going the negative direction, or when either electrode wires or coil wires are reversed. This also enables the totalizer to count in the reverse direction.

Display Language

375	Transducer Block, Detailed Setup

This allows you to configure the language shown on the display. There are five options available:

- English
- Spanish
- Portuguese
- German
- French

Signal Processing

375	Transducer Block, Detailed Setup

The 8732E contains several advanced functions that can be used to stabilize erratic outputs caused by process noise. The signal processing menu contains this functionality.

Operating Mode

375	Transducer Block, Detailed Setup, Signal Processing

The Operating Mode should be used only when the signal is noisy and gives an unstable output. Filter mode automatically uses 37 Hz coil drive mode and activates signal processing at the factory set default values. When using filter mode, perform an auto zero with no flow and a full sensor. Either of the parameters, coil drive mode or signal processing, may still be changed individually. Turning Signal Processing off or changing the coil drive frequency to 5 Hz will automatically change the Operating Mode from filter mode to normal mode.

Man Config DSP

375	Transducer Block, Detailed Setup, Signal Processing

Manually configure the digital signal processing parameters.

The 8732E transmitter includes digital signal processing capabilities that can be used to condition the output from the transmitter by enabling noise rejection. See Appendix D: Digital Signal Processing for more information on the DSP functionality.

Control

375	**Transducer Block, Detailed Setup, Signal Processing, Man Config DSP**

When ON is selected, the Rosemount 8732E output is derived using a running average of the individual flow inputs. Signal processing is a software algorithm that examines the quality of the electrode signal against user-specified tolerances. This average is updated at the rate of 10 samples per second with a coil drive frequency of 5 Hz, and 75 samples per second with a coil drive frequency of 37 Hz. The three parameters that make up signal processing (number of samples, maximum percent limit, and time limit) are described below.

Samples

375	**Transducer Block, Detailed Setup, Signal Processing, Man Config DSP**

0 to 125 Samples

The number of samples function sets the amount of time that inputs are collected and used to calculate the average value. Each second is divided into tenths (1/10) with the number of samples equaling the number of 1/10 second increments used to calculate the average.

For example, a value of:

1 averages the inputs over the past 1/10 second

10 averages the inputs over the past 1 second

100 averages the inputs over the past 10 seconds

125 averages the inputs over the past 12.5 seconds

% Limit

375	**Transducer Block, Detailed Setup, Signal Processing, Man Config DSP**

0 to 100 Percent

The maximum percent limit is a tolerance band set up on either side of the running average. The percentage value refers to deviation from the running average. For example, if the running average is 100 gal/min, and a 2 percent maximum limit is selected, then the acceptable range is from 98 to 102 gal/min.

Values within the limit are accepted while values outside the limit are analyzed to determine if they are a noise spike or an actual flow change.

Time Limit

375	**Transducer Block, Detailed Setup, Signal Processing, Man Config DSP**

0 to 256 Seconds

The time limit parameter forces the output and running average values to the new value of an actual flow rate change that is outside the percent limit boundaries. It thereby limits response time to flow changes to the time limit value rather than the length of the running average.

For example, if the number of samples selected is 100, then the response time of the system is 10 seconds. In some cases this may be unacceptable. By setting the time limit, you can force the 8732E to clear the value of the running average and re-establish the output and average at the new flow rate once the time limit has elapsed. This parameter limits the response time added to the loop. A suggested time limit value of two seconds is a good starting point for most applicable process fluids. The selected signal processing configuration may be turned ON or OFF to suit your needs.

Coil Drive Frequency

375	Transducer Block, Detailed Setup, Signal Processing

Coil drive frequency allows pulse-rate selection of the sensor coils.

5 Hz
The standard coil drive frequency is 5 Hz, which is sufficient for nearly all applications.

37 Hz
If the process fluid causes a noisy or unstable output, increase the coil drive frequency to 37 Hz. If the 37 Hz mode is selected, perform the auto zero function with no flow and a full sensor.

Low Flow Cutoff

375	Transducer Block, Detailed Setup, Signal Processing

Low flow cutoff allows you to specify the flow rate, between 0.01 and 38.37 feet per second, below which the outputs are driven to zero flow. The units format for low flow cutoff cannot be changed. It is always displayed as feet per second regardless of the format selected. The low flow cutoff value applies to both forward and reverse flows.

Primary Variable Damping

375	Transducer Block, Detailed Setup, Signal Processing

0 to 256 Seconds

Primary Variable Damping allows selection of a response time, in seconds, to a step change in flow rate. It is most often used to smooth fluctuations in output.

Device Info

375	Transducer Block, Detailed Setup

Information variables are used for identification of flowmeters in the field and to store information that may be useful in service situations. Information variables have no effect on flowmeter output or process variables.

Device ID

375	Transducer Block, Detailed Setup, Device Info

This function displays the Device ID of the transmitter. This is one piece of information required to generate a license code to enable diagnostics in the field.

PV Sensor S/N

375	Transducer Block, Detailed Setup, Device Info

The PV sensor serial number is the serial number of the sensor connected to the transmitter and can be stored in the transmitter configuration for future reference. The number provides easy identification if the sensor needs servicing or for other purposes.

Sensor Tag

375	Transducer Block, Detailed Setup, Device Info

Sensor tag is the quickest and shortest way of identifying and distinguishing between sensors. Sensors can be tagged according to the requirements of your application. The tag may be up to eight characters long.

DSP Software Rev

375	Transducer Block, Detailed Setup, Device Info

This function displays the software revision number of the transmitter.

Construction Materials

375	Transducer Block, Detailed Setup, Device Info

Construction materials contain information about the sensor that is connected to the transmitter. This information is configured into the transmitter for later reference. This information can be helpful when calling the factory for support.

Flange Type

375	Transducer Block, Detailed Setup, Device Info, Construction Materials

Flange type enables you to select the flange type for your magnetic transmitter system. This variable only needs to be changed if you have changed your sensor. Options for this value are:

• ANSI 150	• PN 10
• ANSI 300	• PN 16
• ANSI 600	• PN 25
• ANSI 900	• PN 40
• ANSI 1500	• PN 64
• ANSI 2500	• Other
• Wafer	

Flange Material

375	Transducer Block, Detailed Setup, Device Info, Construction Materials

Flange material enables you to select the flange material for your magnetic transmitter system. This variable only needs to be changed if you have changed your sensor. Options for this value are:

- Carbon Steel
- 304L Stainless Steel
- 316L Stainless Steel
- Wafer
- Other

Electrode Type

375	Transducer Block, Detailed Setup, Device Info, Construction Materials

Electrode type enables you to select the electrode type for your magnetic transmitter system. This variable only needs to be changed if you have replaced electrodes or if you have replaced your sensor. Options for this value are:

- Standard
- Std & Ground
- Bullet
- Other

Electrode Material

375	Transducer Block, Detailed Setup, Device Info, Construction Materials

Electrode Material enables you to select the electrode material for your magnetic transmitter system. This variable only needs to be changed if you have replaced electrodes or if you have replaced your sensor. Options for this value are:

- 316L SST
- Nickel Alloy 276 (UNS N10276)
- Tantalum
- Titanium
- 80% Platinum – 20% Iridium
- Alloy 20
- Other

Liner Material

375	Transducer Block, Detailed Setup, Device Info, Construction Materials

Liner material enables you to select the liner material for the attached sensor. This variable only needs to be changed if you have replaced your sensor. Options for this value are:

- PTFE
- ETFE
- PFA
- Polyurethane
- Linatex
- Natural Rubber
- Neoprene
- Other

MODE

375	Transducer Block

Set and review the mode configuration for the transducer function block.

Block Mode: Target

375	Transducer Block, Mode

Operator requested mode for the function block. Only one selection may be made. Options include:

Auto
Use this mode when all configuration changes to the block are complete and the transmitter is ready to be returned to service.

OOS
Out of service mode. Use this mode when making configuration changes to parameters found in the function block. This removes the transmitter from operation until the mode is set back to Auto.

Block Mode: Actual

375	Transducer Block, Mode

This is the current mode of the function block. This mode may differ from the Target mode based on operating conditions.

Block Mode: Permitted

375	Transducer Block, Mode

This parameter defines which modes are available for a given function block.

Block Mode: Normal

375	Transducer Block, Mode

Displays the mode that the function block should be set to for normal operation.