

# 2465 Piston Gauge with Autofloat Controller Setup in COMPASS for Pressure

**FLUKE**®

**Calibration**

*This procedure is intended for Fluke Calibration customers trained on use of 2465 Piston Gauge, 2465 Autofloat Controller and COMPASS for Pressure Calibration Software.*

## Purpose

This document instructs how to setup a 2465 PG with Autofloat Controller in COMPASS for Pressure. Also see document “2465 Piston Gauge with Autofloat Controller, Initialize Test Example in COMPASS for Pressure”.

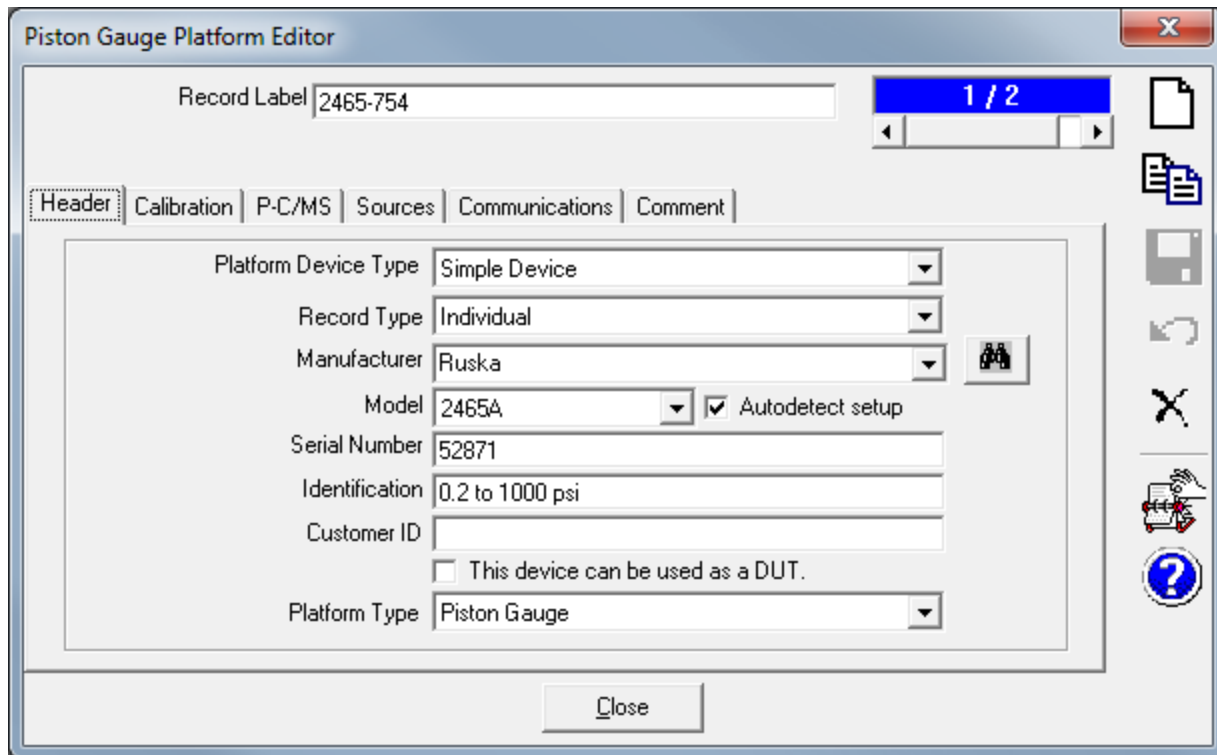
## Note

If you have a CD or electronic version of the .pc and .ms WinPrompt files use the COMPASS for Pressure import feature. See the document “Import individual Ruska PC, MS into COMPASS.pdf” and the Application Note, “How to set up COMPASS® for Pressure software for use with Ruska Model 2400 piston gauges”

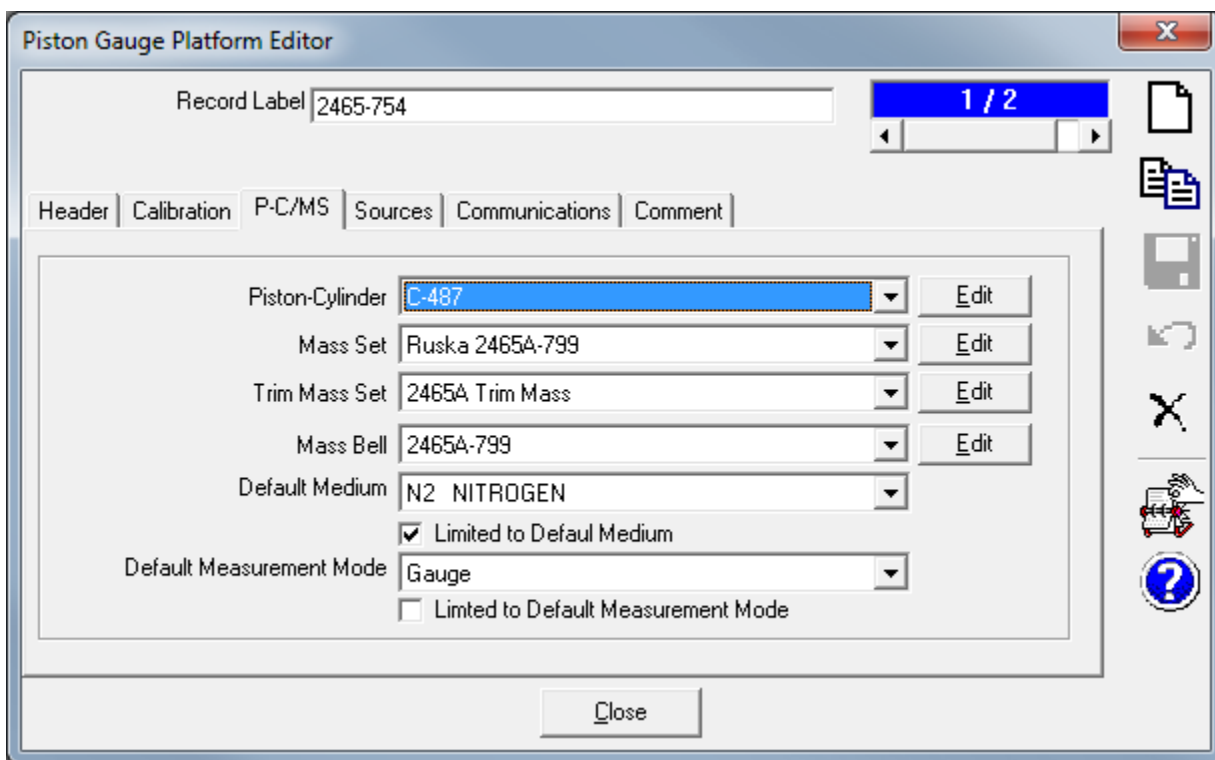
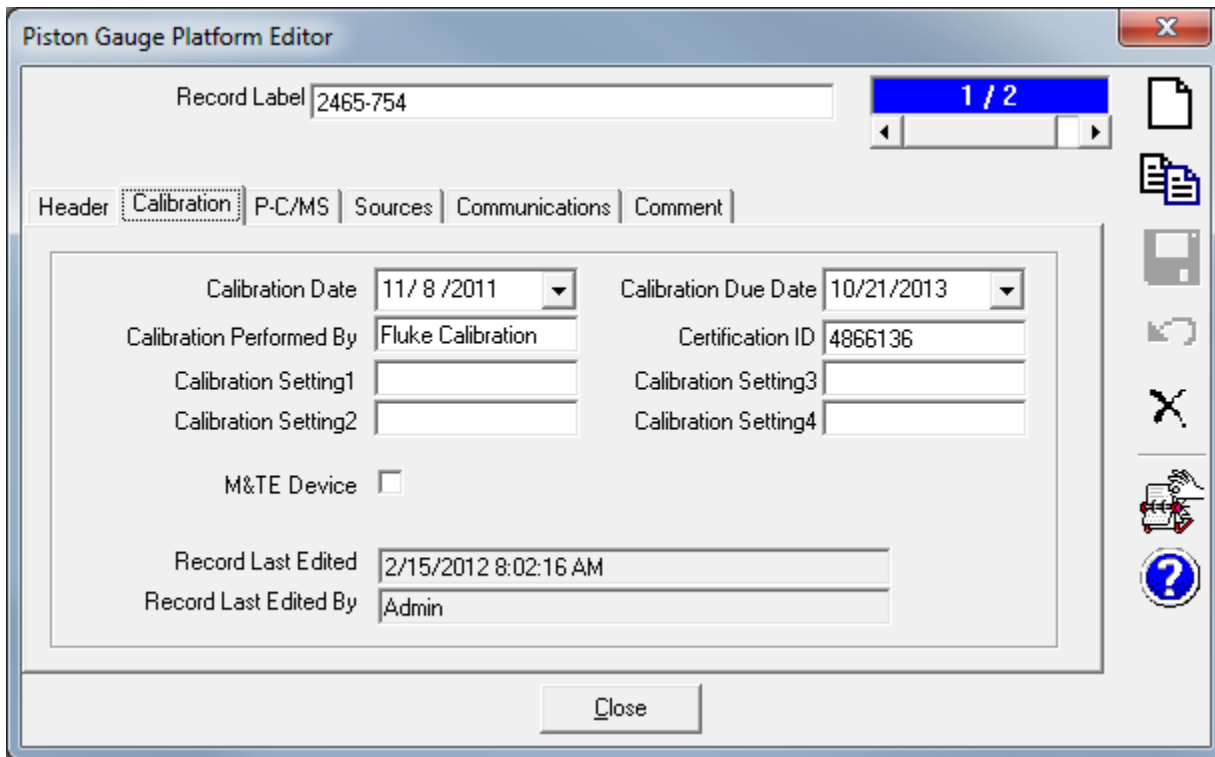
## Instructions

First setup the piston-cylinder, mass set and trim mass set (if applicable) setup files so they can be chosen in the Autofloat controller setup. See page 4 for examples of these.

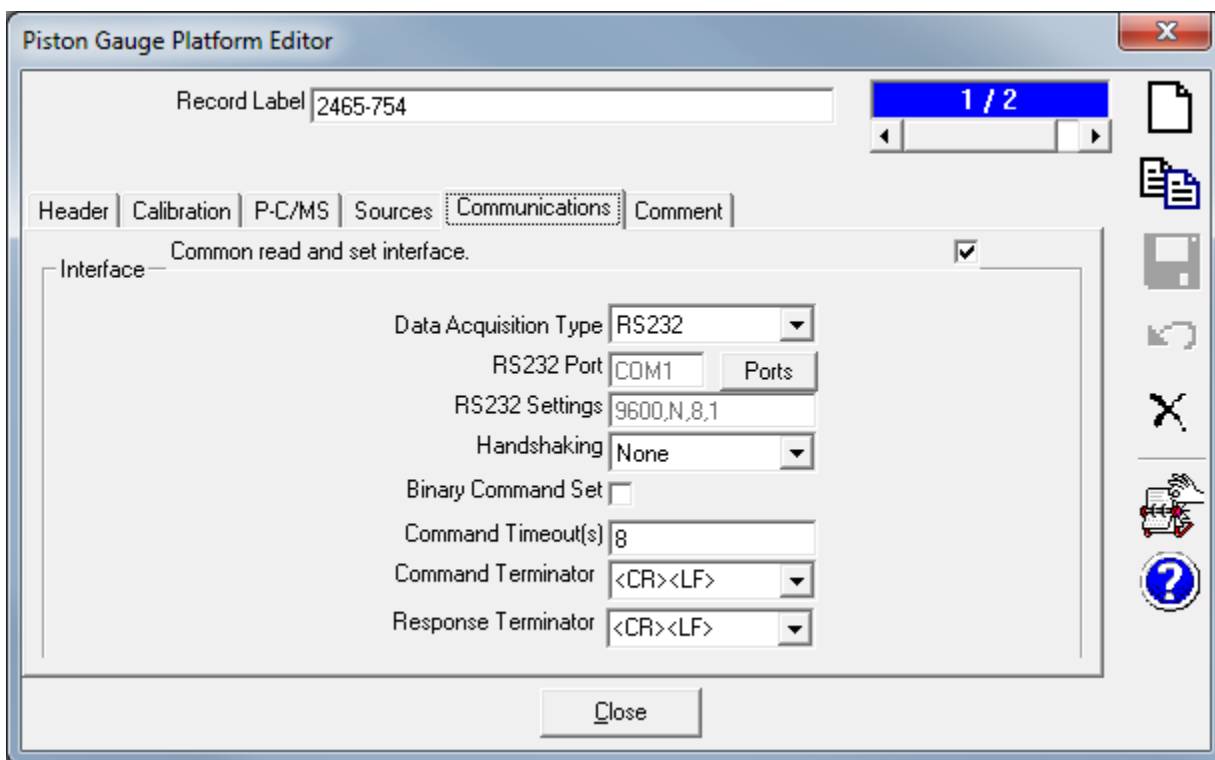
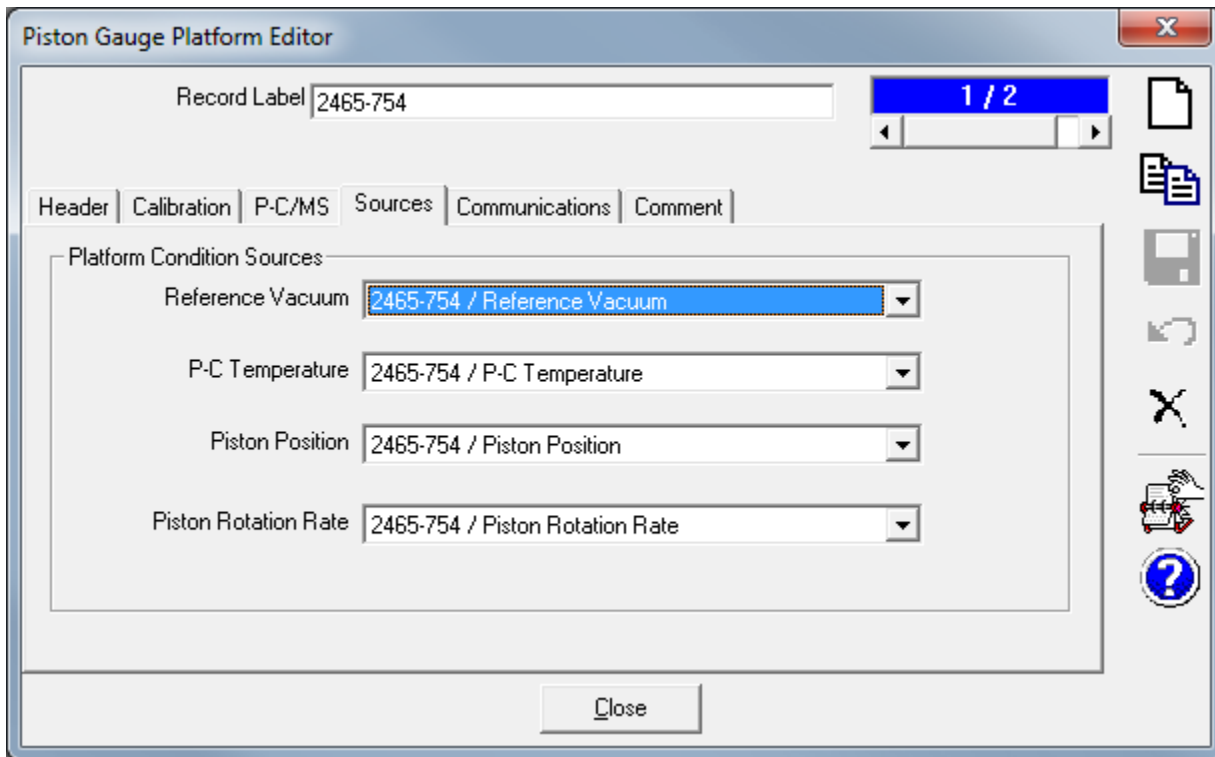
### 2465 Autofloat Controller



The screenshot shows the 'Piston Gauge Platform Editor' window. At the top, the 'Record Label' is '2465-754' and a page indicator shows '1 / 2'. Below this are tabs for 'Header', 'Calibration', 'P-C/MS', 'Sources', 'Communications', and 'Comment'. The main area contains several fields: 'Platform Device Type' (Simple Device), 'Record Type' (Individual), 'Manufacturer' (Ruska), 'Model' (2465A) with an 'Autodetect setup' checkbox checked, 'Serial Number' (52871), 'Identification' (0.2 to 1000 psi), 'Customer ID' (empty), and 'Platform Type' (Piston Gauge). There is also an unchecked checkbox for 'This device can be used as a DUT.'. A 'Close' button is at the bottom. On the right side, there is a vertical toolbar with icons for file operations and help.



Save the Autofloat controller setup here by clicking the black disk icon. This is so COMPASS will know that this is an Autofloat controller with Reference Vacuum, P-C Temperature, Piston Position, and Rotation sensors. Otherwise COMPASS doesn't know yet that you are setting up an Autofloat controller as an Autodetect device and you won't be able to choose the sensors in the "Sources" tab.



## Piston-Cylinder Unit C-487

Piston-Cylinder Editor

Piston-Cylinder Label: C-487

1 / 5

Header | Calibration | Tolerance | Characteristics

Manufacturer	Ruska
Model	2465-727
Serial Number	C487
Identification	Mid range piston -100psi
Customer ID	S638838-5
Piston-Cylinder Type	Piston Gauge

Close

Piston-Cylinder Editor

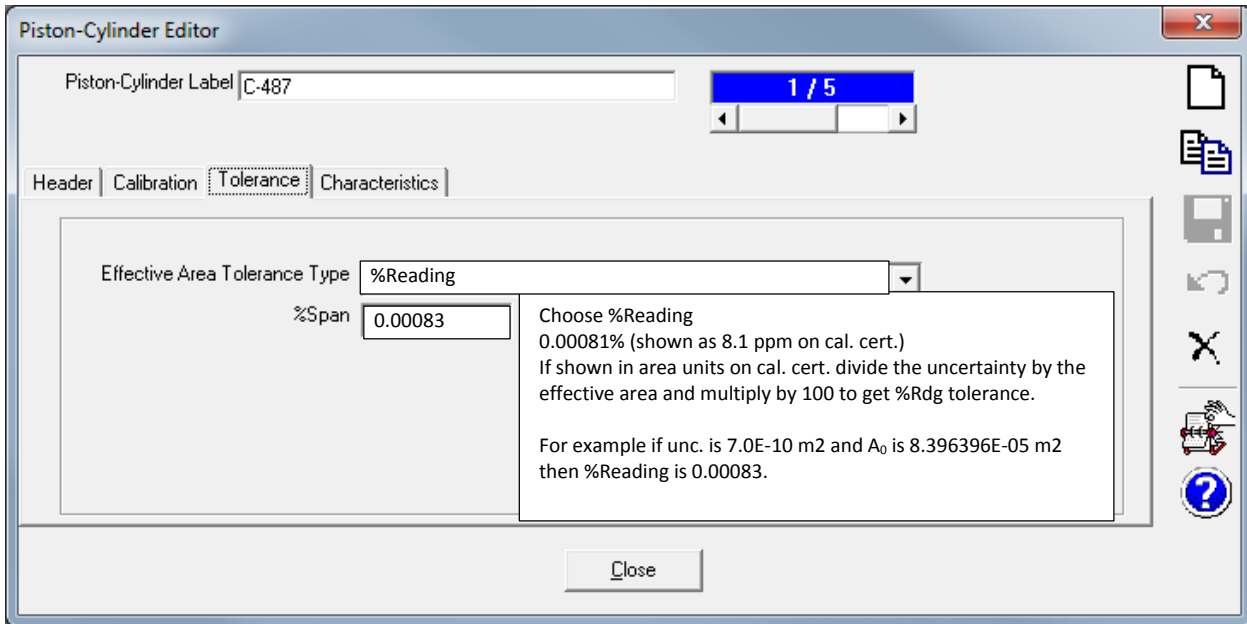
Piston-Cylinder Label: C-487

1 / 5

Header | Calibration | Tolerance | Characteristics

Calibration Date	11/1/2011
Calibration Due Date	10/21/2013
Calibration Performed By	Fluke Calibration
Certification ID	111101C-487
M&TE Device	<input type="checkbox"/>
Record Last Edited	2/14/2012 12:26:27 PM
Record Last Edited By	Admin

Close



Piston-Cylinder Editor

Piston-Cylinder Label: C-487

1 / 5

Header | Calibration | Tolerance | **Characteristics**

**A<sub>0</sub> at 23C on cal. cert.**

**Use "True Mass" value**

**Use "Density" value**

Leave at 0 for all Ruska systems

Effective Area: 8.396396E-5 m<sup>2</sup>

Temperature Reference: 23 C

Mass: 1.002922E-1 kg

Mass Resolution: 0.0000001 kg

Average Density: 13.3 g/cm<sup>3</sup>

Min Rotation Rate (RPM): 0

Max Rotation Rate (RPM): 0

Piston Thermal Expansion: 9.10 c from cal. cert.

Cylinder Thermal Expansion: 0.00 zero /C

Pressure Expansion: 1.610E-5 b<sub>1</sub> Pa

Pressure Expansion 2nd: 0.000E0 b<sub>2</sub> Pa<sup>2</sup>

Reference Level Offset: 0.000E0 in

L1: 3.7(L1) in

Surface Tension(N/m): zero for gas systems

Max Sink Rate: 0.15 in/min

Close

$A_0$  = Effective Area (note this also contains the reference temp value for COMPASS)

c = Piston Thermal Expansion (actually a combination of both piston and cylinder expansion so thus cylinder is generally 0, or can split the value between the two fields to avoid confusion ... either way - these two fields are added together in the pressure formula)

b<sub>1</sub> = Pressure Expansion

b<sub>2</sub> = Pressure Expansion 2nd (Second order relationship ... generally 0)

Reference Level Offset = In COMPASS, this field is only used on some DH Instruments/Fluke pistons, and would be noted on the calibration report. Surface Tension field is 0 unless oil is being used in the system. For Rotation Rates I am not sure if you have the hardware to monitor this and/or what its limits are or if these even apply to a 2465 so I just put what is generally acceptable. Basically if the piston is spinning it is centered so ok to take data as long as it does spin too fast <~50 RPM to where it might actually create lift.

L1 = Same label in the calibration report. The effective length of the piston, from top of mass loading surface to the location where changes in test fluid density have no impact on the pressure calculation. The L1 value is used only with Ruska piston gauges. It is used with the Hanger Depth ("D") dimension of the sleeve weight in determining fluid head pressure relative to the float position line on the mounting post or indicator. The unit of measure is the same as what is selected in "Reference Level Offset" field.

Max Sink Rate = Same label in the calibration report. Fall rate limit that this piston might see as it naturally sinks through its float zone. Used to determine Ready/Not Ready with some systems.

## Piston-Cylinder Unit TL-1463

Piston-Cylinder Editor

Piston-Cylinder Label: TL-1463

4 / 5

Header | Calibration | Tolerance | Characteristics

Manufacturer	Ruska
Model	2465-725
Serial Number	TL-1463
Identification	Lo Range - 25 psi
Customer ID	S638837-6
Piston-Cylinder Type	Piston Gauge

Close

Piston-Cylinder Editor

Piston-Cylinder Label: TL-1463

4 / 5

Header | Calibration | Tolerance | Characteristics

Calibration Date	10/31/2011
Calibration Due Date	10/21/2013
Calibration Performed By	Fluke Calibration
Certification ID	11101TL-1463
M&TE Device	<input type="checkbox"/>
Record Last Edited	2/14/2012 11:05:51 AM
Record Last Edited By	Admin

Close

Piston-Cylinder Editor

Piston-Cylinder Label: TL-1463

4 / 5

Header | Calibration | **Tolerance** | Characteristics

Effective Area Tolerance Type: %Reading

%Span: 0.00081

Choose %Reading  
0.00081% (shown as 8.1 ppm on cal. cert.)  
If shown in area units on cal. cert. divide the uncertainty by the effective area and multiply by 100 to get %Rdg tolerance.

For example if unc. is 2.7E-09 m<sup>2</sup> and A<sub>0</sub> is 3.357445E-04 m<sup>2</sup> then %Reading is 0.00081.

Close

Piston-Cylinder Editor

Piston-Cylinder Label: TL-1463

4 / 5

Header | Calibration | Tolerance | **Characteristics**

Effective Area	3.357384E-4	m <sup>2</sup>	Piston Thermal Expansion	1.500E-5	/C
Temperature Reference	23	C	Cylinder Thermal Expansion	0.000E0	/C
Mass	4.719390E-2	kg	Pressure Expansion	4.047E-5	/MPa
Mass Resolution	0.0000001	kg	Pressure Expansion 2nd	0.000E0	/MPa <sup>2</sup>
Average Density	7.8	g/cm <sup>3</sup>	Reference Level Offset	0.000E0	in
Min Rotation Rate (RPM)	0		L1	1.600E0	in
Max Rotation Rate (RPM)	0		Surface Tension(N/m)	0	
			Max Sink Rate	0.08	in/min

Close



## Piston-Cylinder Unit V-1478

Piston-Cylinder Editor

Piston-Cylinder Label: V-1478 5 / 5

Header | Calibration | Tolerance | Characteristics

Manufacturer	Ruska
Model	2465-729
Serial Number	V1478
Identification	High Range-1000psi
Customer ID	S638838-4
Piston-Cylinder Type	Piston Gauge

Close

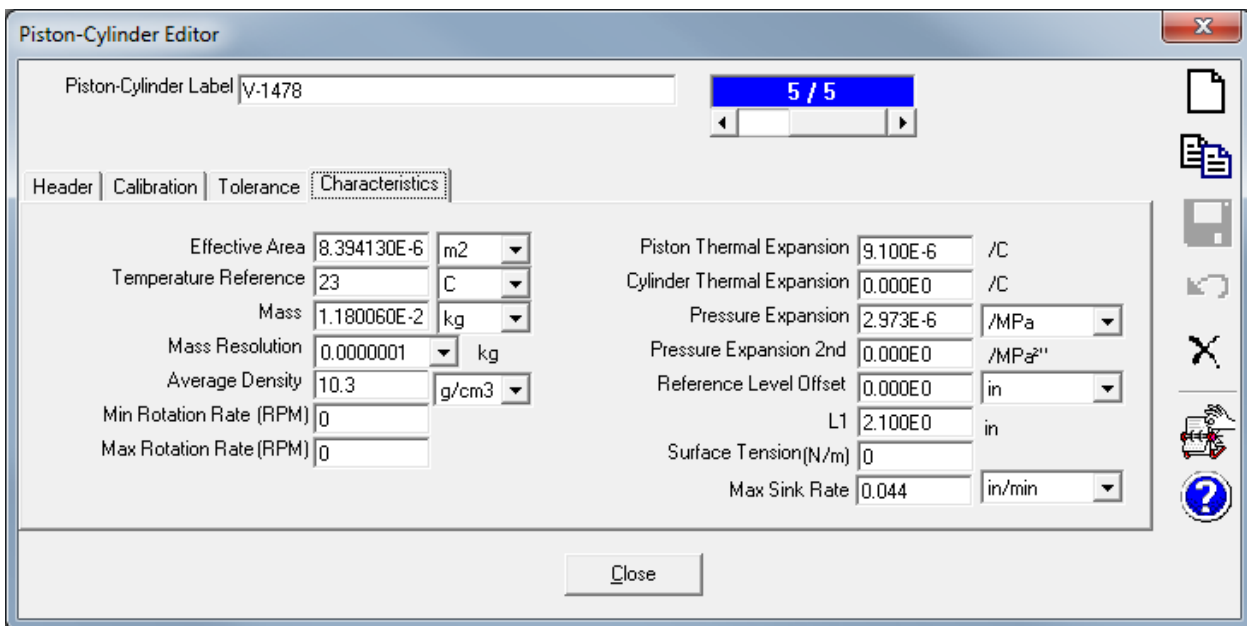
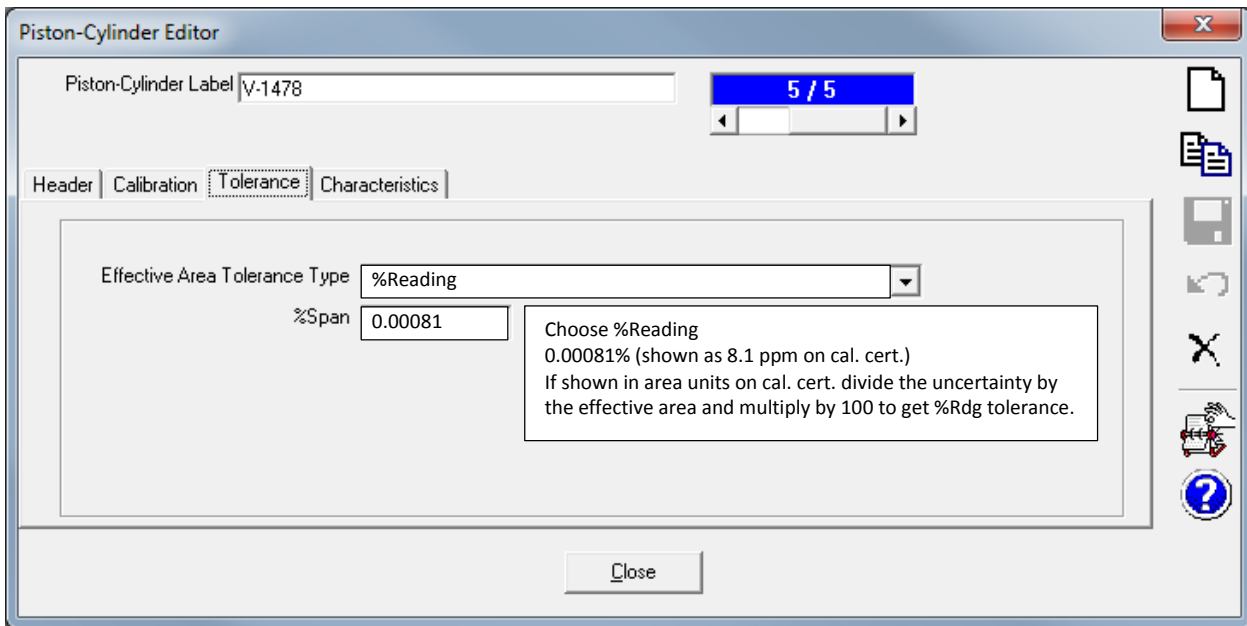
Piston-Cylinder Editor

Piston-Cylinder Label: V-1478 5 / 5

Header | Calibration | Tolerance | Characteristics

Calibration Date	11/1/2011
Calibration Due Date	10/21/2013
Calibration Performed By	Fluke Calibration
Certification ID	11110V-1478
M&TE Device	<input type="checkbox"/>
Record Last Edited	2/14/2012 12:26:21 PM
Record Last Edited By	Admin

Close



## 2465A Trim Mass Set

Mass Set Editor

Mass Set Label: 2465A Trim Mass

1 / 4

Header | Calibration | Mass Set

Manufacturer: Ruska

Model: 2465A

Serial Number: 24834

Identification: Trim Mass Set

Customer ID: S638838

Mass Set Type: Piston Gauge Trim Mass

Close

Mass Set Editor

Mass Set Label: 2465A Trim Mass

1 / 4

Header | Calibration | Mass Set

Calibration Date: 9 /18/2009

Calibration Due Date: 9 /23/2013

Calibration Performed By: 589

Certification ID:

M&TE Device:

Record Last Edited: 2/14/2012 1:06:26 PM

Record Last Edited By: Admin

Close

Mass Set Editor

Mass Set Label: 2465A Trim Mass

1 / 4

Header | Calibration | Mass Set

Total Trim Mass\* (g): 210

Available Resolution\*: 0.001

Mass Set Density: 8000

Mass Density Unit: kg/m3

Close

### 2465A Mass Set

Mass Set Editor

Mass Set Label: Ruska 2465A-799

2 / 4

Header | Calibration | Mass Set

Manufacturer: Ruska

Model: 2465A-799

Serial Number: 52798

Identification: Mass Set for Gas

Customer ID: S638837-3

Mass Set Type: Piston Gauge

Close

Mass Set Editor

Mass Set Label:  2 / 4

Header: Calibration | Mass Set

Calibration Date:

Calibration Due Date:

Calibration Performed By:

Certification ID:

M&TE Device:

Record Last Edited:

Record Last Edited By:

Mass Set Editor

Mass Set Label:  2 / 4

Header: Calibration | Mass Set

Individual Masses

14	0.0100000	kg
13	0.0200000	kg
12	0.0300000	kg
11	0.0500000	kg
10	0.1000000	kg
9	0.2000000	kg
8	0.3000000	kg
7	0.5000000	kg
2	1.0000000	kg
3	1.0000000	kg
4	1.0000000	kg
5	1.0000000	kg
6	1.0000000	kg

Individual Mass Settings

Mass Name\*:

Nominal Mass:

True Mass\*:

Tolerance\*:

Mass Density\*:

Makeup Mass:

Mass Unit:

Mass Density Unit:

Mass Set Resolution:

Mass Set Total:

2465 Mass Bell

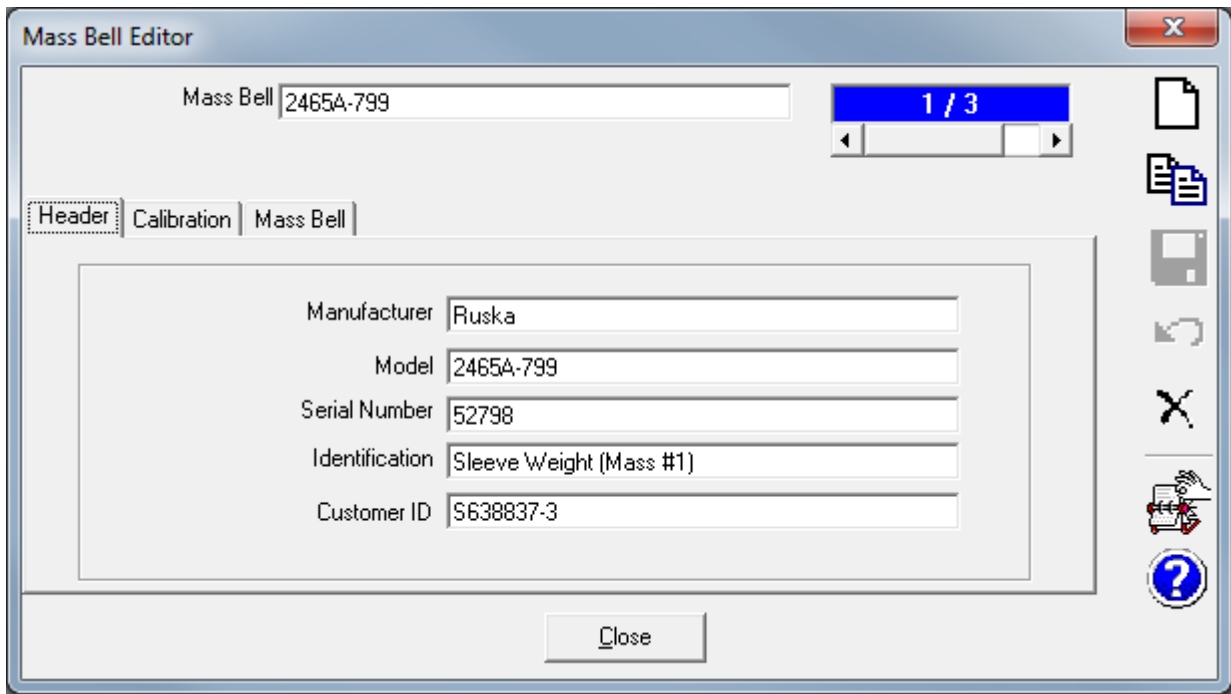
Mass Bell Editor

Mass Bell 2465A-799 1 / 3

Header Calibration Mass Bell

Manufacturer	Ruska
Model	2465A-799
Serial Number	52798
Identification	Sleeve Weight (Mass #1)
Customer ID	S638837-3

Close

The screenshot shows the 'Mass Bell Editor' window with the 'Mass Bell' field set to '2465A-799'. The 'Header' tab is selected, and the 'Mass Bell' sub-tab is active. The main content area contains five text input fields: 'Manufacturer' (Ruska), 'Model' (2465A-799), 'Serial Number' (52798), 'Identification' (Sleeve Weight (Mass #1)), and 'Customer ID' (S638837-3). A 'Close' button is at the bottom center. On the right side, there is a vertical toolbar with icons for file operations, a question mark, and a red X.

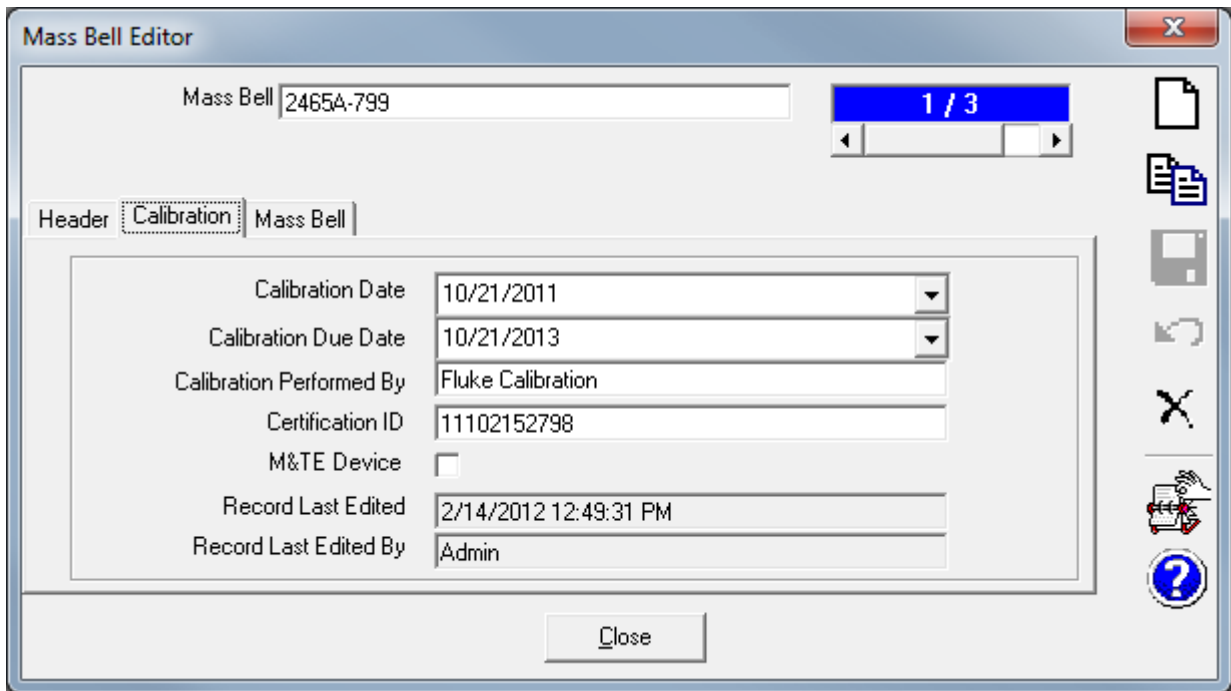
Mass Bell Editor

Mass Bell 2465A-799 1 / 3

Header Calibration Mass Bell

Calibration Date	10/21/2011
Calibration Due Date	10/21/2013
Calibration Performed By	Fluke Calibration
Certification ID	11102152798
M&TE Device	<input type="checkbox"/>
Record Last Edited	2/14/2012 12:49:31 PM
Record Last Edited By	Admin

Close

The screenshot shows the 'Mass Bell Editor' window with the 'Mass Bell' field set to '2465A-799'. The 'Header' tab is selected, and the 'Calibration' sub-tab is active. The main content area contains seven text input fields: 'Calibration Date' (10/21/2011), 'Calibration Due Date' (10/21/2013), 'Calibration Performed By' (Fluke Calibration), 'Certification ID' (11102152798), 'M&TE Device' (checkbox), 'Record Last Edited' (2/14/2012 12:49:31 PM), and 'Record Last Edited By' (Admin). A 'Close' button is at the bottom center. On the right side, there is a vertical toolbar with icons for file operations, a question mark, and a red X.

Mass Bell Editor

Mass Bell 2465A-799 1 / 3

Header Calibration **Mass Bell**

Use "True Mass" value Mass \* 1.171384E-1 kg

Mass Resolution \* 0.0000001 kg

Use "Density" value Average Density \* 3.100E3 kg/m3

Mass Bell Tolerance \* 5.855E-7 kg

"Hanger Depth" D (Hanger Mass Depth) 1.9400 in

Sleeve Offset -0.00397 in

Close

If the Sleeve Mass is the light two-piece model and about 120 grams, then enter -0.003937 in (-0.001 m) for the Sleeve Offset.

If the Sleeve Mass is the heavier one piece model and about 500 grams, then enter 0 (zero) for the Sleeve Offset.

*End of Procedure*