



The Company

We are an established world force in the design and manufacture of instrumentation for industrial process control, flow measurement, gas and liquid analysis and environmental applications.

As a part of ABB, a world leader in process automation technology, we offer customers application expertise, service and support worldwide.

We are committed to teamwork, high quality manufacturing, advanced technology and unrivalled service and support.

The quality, accuracy and performance of the Company's products result from over 100 years experience, combined with a continuous program of innovative design and development to incorporate the latest technology.

The UKAS Calibration Laboratory No. 0255 is just one of the ten flow calibration plants operated by the Company and is indicative of our dedication to quality and accuracy.

EN ISO 9001:2000



Cert. No. Q 05907

EN 29001 (ISO 9001)



Lenno, Italy –
Cert. No. 9/90A

Stonehouse, U.K.



Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of the Technical Publications Department.

Health and Safety

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.

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1 Software Description

This software is the sizing and selection tool for the new ABB OriMaster flow meter.

OriMaster is a compact orifice flow meter comprising an orifice carrier assembly, impulse piping, manifold and transmitter. It is available in two versions:

- **OriMaster V** for:
 - volumetric flow measurement in actual volume units
 - uncompensated measurement (constant temperature and pressure) in mass flow units
- **OriMaster M** for:
 - compensated mass flow measurement (measurement in kg/h or lb/min with varying temperature and/or pressure)
 - compensated volume flow measurement (measurement in Nm³/h or SCFM with varying temperature and/or pressure)
 - PROFIBUS®, FOUNDATION™ Fieldbus or Modbus® communication

The software offers the following features:

- Accessible on-line at www.abb.com
- Stand-alone CD version (no installation necessary)
- Customer/Project data recording
- Application data entry in a large variety of units
- Context-sensitive notes to assist data entry/selection
- Calculation of differential pressure and approximate pressure loss for two Beta (throat) ratios
- Full product order code generation
- A variety of data output options – all entered/calculated data can be:
 - saved and retrieved
 - printed (from PDF file)
 - exported in Excel format
 - exported in XML format
- Links to documentation downloads (subject to internet connection)

2 Introduction

When the application is launched, the 'Introduction' screen is displayed – see Fig. 2.1.

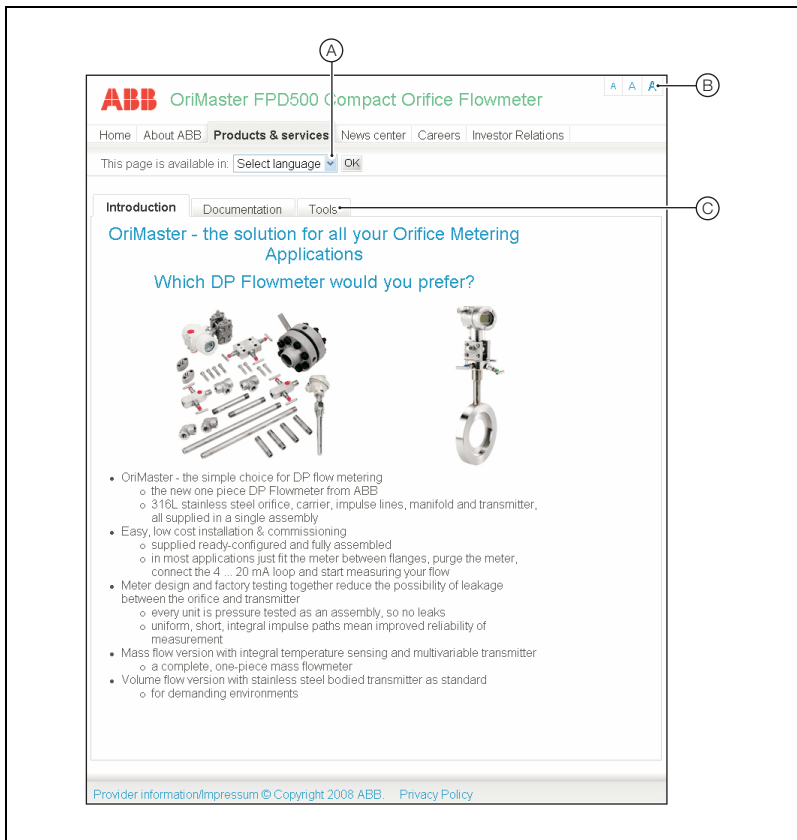


Fig. 2.1 Introduction Screen

Select the software operating language from the drop-down list (A) and click **OK**.

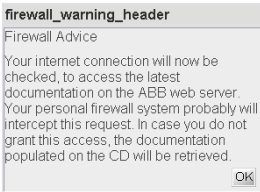
Select the required display text size by clicking on the small, medium or large font symbols (B).

Click on the tabs (C) to access the other screens.

3 Documentation

The 'Documentation' screen (see Fig. 3.1) is a pre-configured search utility that enables a user to access OriMaster documentation.

When the Documentation tab is first clicked, a firewall warning is displayed:



Click **OK** to continue. If an internet connection is detected, access is enabled to the latest documentation from within the ABB Download Centre. If an internet connection is not detected, or a personal firewall blocks access to the ABB Download Centre, access is enabled to the documentation from the CD.

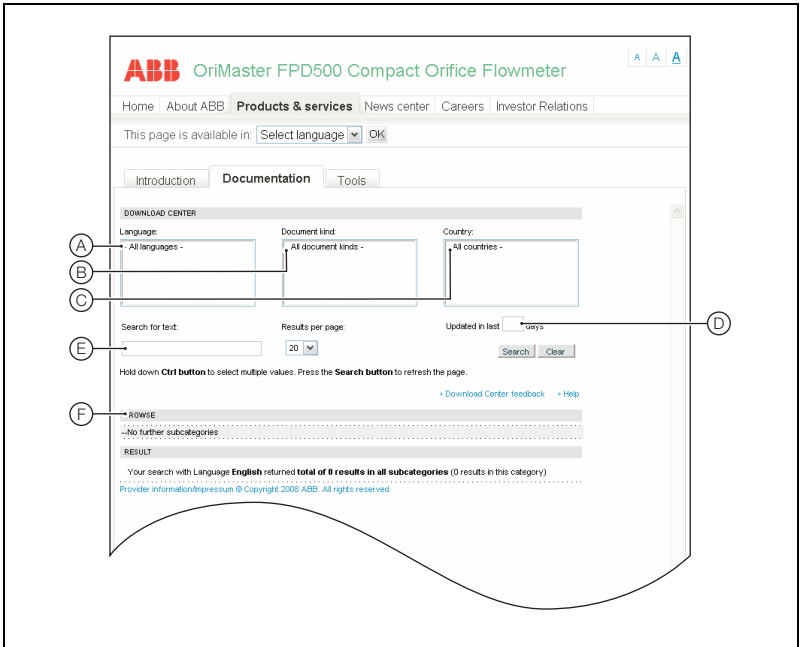







Fig. 3.1 Documentation Screen

Referring to Fig. 3.1:

- (A) Language** The language defaults to the last language selected in the OriMaster software.
If the required language is not displayed select 'All languages' then select the language required from the list.
To display OriMaster documents in more than one language, press and hold  and click on each of the required languages.
- (B) Document kind** Select the required type of OriMaster document (manual, data sheet, etc.) from the list.
To display all OriMaster document kinds, select 'All document kinds'.
To display multiple OriMaster document kinds, press and hold  and click on each of the required documents.
- (C) Country** To display OriMaster documents produced in a particular country, select the country from the list.
To display OriMaster documents produced in all countries, select 'All countries'.
To display OriMaster documents produced in multiple countries, press and hold  and click on each required country.
- (D) Updated** To display only recently updated OriMaster documents, enter the required number of days into the 'Updated in last....days' box.
- (E) Search for Text** To search for OriMaster documents containing specific words or text string(s), enter the words or text strings in this box.

When all required filters have been set in fields (A) to (E), click the  button to display the OriMaster documents meeting the criteria selected. To clear all search criteria click the  button.

- (F) Browse** The search results appear in the Browse field at the bottom of the screen.
Documents may appear in categories/classifications in this section. Click on the category title to display the documents and/or sub-categories (these also expand when clicked).

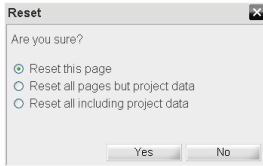
4 Tools

4.1 General

The buttons and icons that are displayed on most of the screens associated with the Tools tab are described as follows:



Resets the data on a page or on multiple pages. Select the data to reset from the 'Reset' dialog:



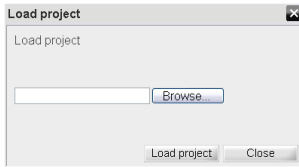
Saves all data/calculations entered so far. The 'File Download' dialog is displayed:




Click Save; a further window prompts for the required file location and name. Amend the default file name as required but *do not change the file extension (.abb)*.








Loads a previously saved set of data/calculation. Browse for the file required from the 'Load a configuration' dialog:



Opens the previous or next screens.

An  icon is displayed against many of the parameters in the Tools screens. Hover the mouse pointer over the icon to display a context sensitive help box to assist in entering data.

The parameters displayed on many of the screens feature drop-down lists for data selection and entry. When a selection is made, the drop-down list disappears and the  button appears against the parameter. Click the button to undo the selection and re-display the drop-down list.

Many parameters require entry of variable data. Enter the data and click the  button adjacent to the parameter or press the keyboard 'Enter' key to confirm data entry. The  button appears against the parameter, the  button is greyed-out and the entry in the parameter field can no longer be changed. Click the  button to reset the parameter.

If an invalid variable value is entered, an 'Invalid Input' error message is displayed showing the allowable input range, for example:



4.2 Fluid Data

The application's process details are entered in the 'Fluid Data' screen – Fig. 4.1.

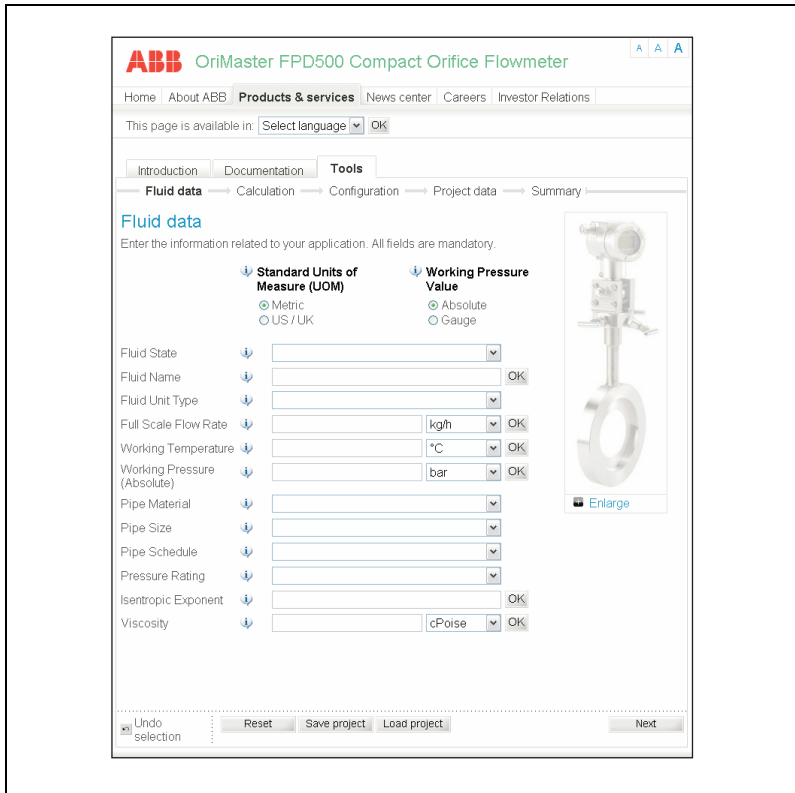


Fig. 4.1 Fluid Data Screen



Select either metric or imperial units of measurement.



Select either gauge or absolute pressure values.

Select the application fluid type:

- Gas**
- Liquid**
- Saturated Steam**

Note. Neither OriMaster nor this sizing tool support superheated steam.

Note. Displayed only if 'Fluid State' is either blank or set to 'Liquid'.

Enter the name of the process fluid and click **OK**.

Note. Displayed only if 'Fluid State' is set to 'Gas'.

Select the application gas. Refer to IM/OM/SDT Section 2 for a list of the gases contained in the software's internal database.

Many common physical properties of the selected gas are displayed automatically in the 'Fluid Data' parameter fields. Density is calculated when the process temperature and pressure are entered.

To enter values different to those displayed automatically, or if the application gas is not listed, select 'Other Gas' and manually enter the data.

Note. Displayed only if 'Gas Component' is set to 'Other Gas'.

Enter the name of the process gas and click **OK**.

Select the flow rate units required:

Mass Flow – the flow rate is specified in units of mass (for example, kg/hr, Tonnes/d)

Volume Flow – the flow rate is specified in units of volume (for example, m³/sec, ft³/day)

Enter the value of the flowrate at full scale (the flowrate for 20 mA output).

Select the flow units and click . The units listed are filtered automatically to match the selected 'Fluid Unit Type'.

Enter the value of the normal operating temperature of the process (the temperature to be used in the flow calculation).

Select the required temperature units and click .

Enter the value of the normal operating pressure of the process (the pressure to be used in the flow calculation).

Note.

- If 'Fluid State' is set to 'Saturated Steam', this parameter is calculated automatically by the software.
- The value entered must correspond to the 'Working Pressure Value' selection, for example:
 - If 'Working Pressure Value' is set to 'Gauge' and a value of 5.5 bar is entered, the pressure used for calculation is 5.5 bar gauge (6.513 bar absolute).
 - If 'Working Pressure Value' is set to 'Absolute' and a value of 5.5 bar is entered, the pressure used for calculation is 5.5 bar absolute (4.487 bar gauge).

Select the required pressure units and click .

Select either 'Stainless Steel' or 'Carbon Steel'. If the pipe material is neither of these, contact ABB.

Note. The pipe material selection **must** match the application pipework material. The true size of the pipe bore at working temperature is critical to the accuracy of the DP calculation and the bore size can vary considerably due to differing thermal expansion coefficients of different materials.

Select the nominal pipe size. If the required pipe size is not listed, contact ABB.

Select the schedule of the pipe.

Note.

- Unavailable options are displayed in red.
- This setting affects the actual pipe inside diameter and therefore the accuracy of the DP calculation.

Select the process flange type/rating.

Note. This selection has no affect on the dimensions of the OriMaster selected by the software but, in association with the pipe size, it affects the profile of the centralizing device supplied with the flow meter.

Enter the isentropic exponent value and click **OK**.


If 'Fluid State' is set to 'Saturated Steam', enter the appropriate value from the Steam Data Tables in IM/OM/SDT, Section 1.

If the value is not known, enter the constant pressure/constant volume (cp/cv) value of the gas. This is the ratio of the specific heat capacities, also known as γ (gamma).

Note.

- This parameter is also known as **K** (kappa) and is applicable only to gases. If 'Fluid State' is set to 'Liquid', the value is set automatically to 1.
- If 'Fluid State' is set to 'Gas' and 'Gas Component' is set to a listed gas, this parameter is set automatically to the preset value stored in the software. To use a specific value for the calculation, set 'Gas Component' to 'Other Gas' and enter all parameter values manually.

Working Density kg/m³

If 'Fluid State' is set to either 'Liquid' or 'Saturated Steam', enter the working density value (the density to be used in the flow calculation). Select the units and click .

Note. For saturated steam, enter the appropriate value from the Steam Data Tables in IM/OM/SDT, Section 1.

If 'Fluid State' is set to 'Gas' and 'Gas Component' is set to a listed gas, this parameter is calculated by the software but is displayed only when values for 'Full Scale Flow Rate', 'Working Temperature' and 'Working Pressure' have been entered.

If 'Fluid State' is set to 'Gas' and 'Gas Component' is set to 'Other Gas', this parameter is calculated by the software but is displayed only when the values for 'Full Scale Flow Rate', 'Working Temperature', 'Working Pressure Viscosity' and 'Molecular Weight' are entered. If the calculated value does not agree with an application-specific working density value, recheck all entered values. If a discrepancy still exists, there may be an inconsistency in the application data, for example, the process fluid is not 'pure'. If the application value of the working density *must* be used, adjust the 'Molecular Weight' (MW) value to give the required working density (WD) value (the MW value has no other effect on the calculation).

Example:

Application MW = 21.5;
Application WD = 9.1 kg/m³;
Calculated WD = 9.3 kg/m³

$$\frac{\text{Application MW}}{\text{Program MW}} = \frac{\text{Application WD}}{\text{Calculated WD}}$$


or

$$\text{Program MW} = \text{Application MW} \times \frac{\text{Calculated WD}}{\text{Application WD}}$$

$$\text{therefore MW} = 21.5 \times \frac{9.3}{9.1} = 21.97$$

Modify the 'Molecular Weight' parameter value to read 21.9725275 to correct the actual density reading to approx 9.1 kg/m³

Viscosity cPoise 

If 'Fluid State' is set to either 'Liquid' or 'Saturated Steam', enter the value of the normal operating viscosity (the viscosity to be used in the flow calculation). Select the units and click .

Note. For saturated steam, enter the appropriate value from the Steam Data Tables in IM/OM/SDT, Section 1.

If 'Fluid State' is set to 'Gas' and 'Gas Component' is set to a listed gas, this parameter is set automatically to the preset value stored in the software. To use a specific viscosity value for the calculation, set 'Gas Component' to 'Other Gas' and enter all parameter values manually.

Molecular Weight OK

Note. Displayed only if 'Fluid State' is set to 'Gas'.

If 'Gas Component' is set to a listed gas, this parameter is set automatically to the preset value stored in the software. To use a specific molecular weight for the calculation, set 'Gas Component' to 'Other Gas' and enter all parameter values manually.

Gas Reference Conditions

Note. Displayed only if 'Fluid State' is set to 'Gas' and 'Fluid Unit Type' is set to 'Volume Flow'.

Select the base conditions that the volume flow is to be referenced to.

- **0 °C / 32 °F at 1 atmosphere (NTP)**
 - Volume referenced to that occupied by a gas at normal temperature and pressure (NTP) – 0 °C and 1 atmosphere absolute. Units may be prefixed with 'N'.
- **20 °C / 68 °F at 1 atmosphere (RTP)**
 - Volume referenced to that occupied by a gas at room temperature and pressure (RTP) – 20 °C / 68 °F and 1 atmosphere absolute. Units are often prefixed with 'R'.
- **60 °F at 1 atmosphere (STP)**
 - Volume referenced to that occupied by a gas at standard temperature and pressure (STP) – 60 °F and 1 atmosphere absolute. Units are often prefixed with 'S'.

Note. Check the actual reference conditions of the application as there are 2 sets of STP reference conditions in use, worldwide.
- **70 °F at 1 atmosphere (STP)**
 - Volume referenced to that occupied by a gas at STP – 70 °F and 1 atmosphere absolute. Units are often prefixed with 'S'.

Note. Check the actual reference conditions of the application as there are 2 sets of STP reference conditions in use, worldwide.
- **Working Temperature and Pressure (Actual Volumes)**
 - Volume referenced to that occupied by a gas at the actual process operating temperature and pressure, usually referred to as Actual Volume.

Compressibility Factor (Z)	↓	<input type="text"/>	OK
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Note. Displayed only if 'Fluid State' is set to 'Gas' and 'Fluid Unit Type' is set to 'Volume Flow'.

The compressibility factor (Z) is used correct the ideal gas equations to account for how a real gas (as opposed to an ideal gas) responds to changes in pressure and temperature.

Enter a value for Z.

If Z is not known, enter a value of 1.0 to obtain an approximate result. Enter the correct Z value when known to recalculate the DP value.

Click the  button or click  Calculation  to advance to the 'Calculation' screen.

4.3 Calculation

The calculated DP for the two options of Beta ratio are displayed in the 'Calculation' screen – Fig. 4.2.

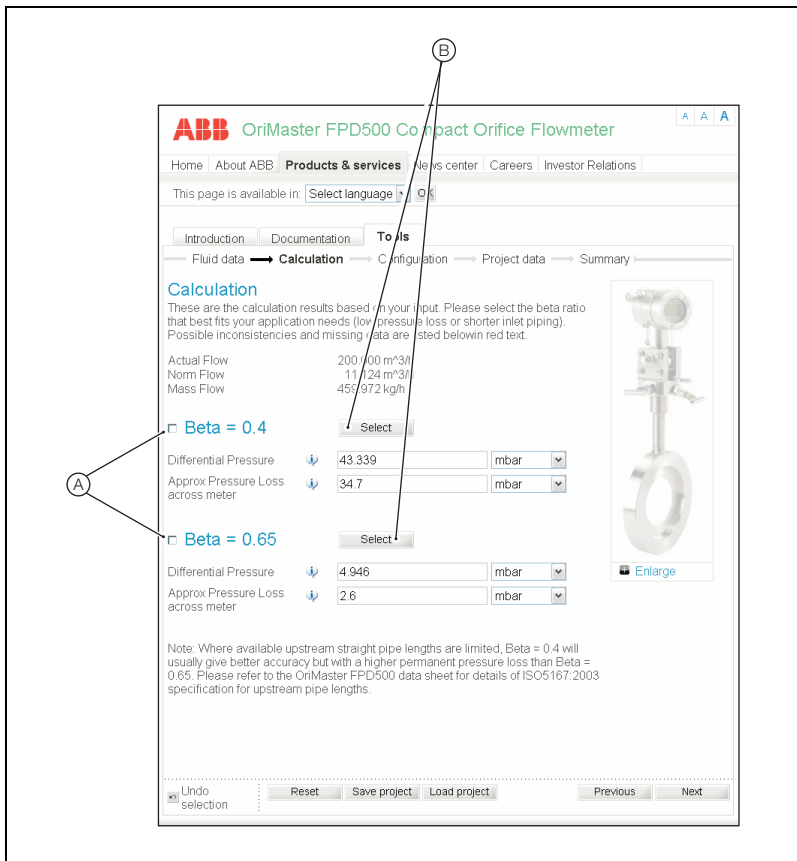
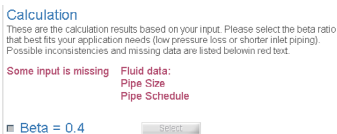


Fig. 4.2 Calculation Screen

Referring to Fig. 4.2:

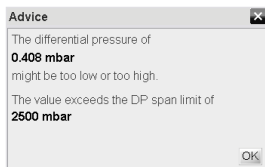
If data required for the DP calculation is missing or inconsistent, the affected parameters are displayed in red:



Click the button or click Fluid data to return to the 'Fluid Data' screen and enter the missing data or correct the inconsistency.

To select a Beta value, click the adjacent checkbox (A) or click the button (B).

If the calculated DP value falls outside the span of the selected Beta ratio, an 'Advice' error message is displayed:



To deselect a Beta value, click checkbox (A) again or click the button (B).

To assist in selecting the appropriate beta ratio based on the calculated DP and pressure losses, refer to the following:

- Where available upstream straight pipe lengths are limited, 'Beta = 0.4' usually gives better accuracy but a higher permanent pressure loss.
- Selecting 'Beta = 0.65' makes the meter more susceptible to shorter upstream pipe lengths, but gives a much lower pressure loss. Refer to the OriMaster data sheet (DS/OM) for details of ISO5167:2003 specification for upstream pipe lengths.

Click the button or click Fluid data to return to the 'Fluid Data' screen

or

Click the button or click Configuration to advance to the 'Configuration' screen.

4.4 Configuration

The full ordering code for the OriMaster is created in the 'Configuration' screen – Fig. 4.3.

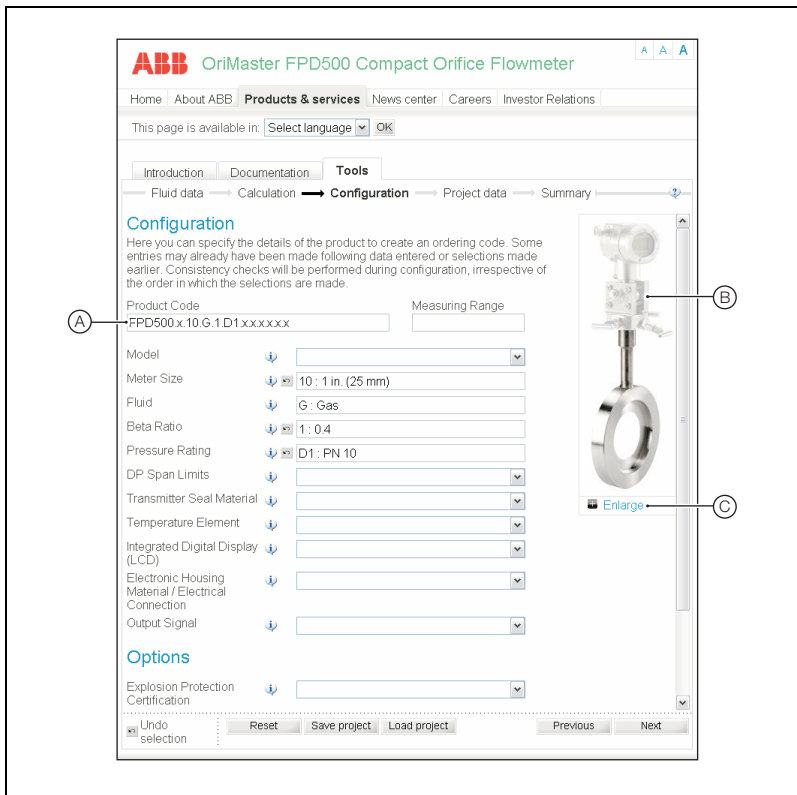


Fig. 4.3 Configuration Screen

If an application has already been sized, the relevant data is used to pre-select certain options automatically.

For example, choices made earlier for Mass/Volume flow, pipe size, Beta ratio, calculated DP span, etc. are reflected in pre-selection of certain coded options.

As further selections are made, the ordering code is constructed at (A). Additionally, the grey product image at (B) builds as selections are made until a full color, general representation of the specified product is displayed. Click on (C) to view an enlarged picture of the product in a new window.

Note. The product image is available on all the Tools tab screens.

Note. With certain options selected, other options become unavailable. Unavailable options are highlighted in red.

Model  



Select the required OriMaster model:

M : Mass Flow (OriMaster M)


- compensates for reduced gas volumes (for example, Nm³/hr at varying temperatures/pressures)
- calculates mass flow (for example, kg/h steam or gas at varying temperatures/pressures)


V : Volume Flow (OriMaster V)

- measures in actual volume
- measures uncompensated mass flow (for example, kg/h steam or gas at fixed temperatures/pressures where no compensation for temperature or pressure is required)



Meter Size   10 : 1 in. (25 mm)

Displays the meter size selected by the software based on the 'Pipe Size' selected in the 'Fluid Data' screen – see page 11.

Click the  button to change the selection if required and select the nominal pipe size. If the required pipe size is not listed, contact ABB.

Fluid  G : Gas

Displays the 'Fluid State' selected in the 'Fluid Data' screen – see page 9.

Beta Ratio   1 : 0.4

Displays the 'Beta Ratio' selected in the 'Calculation' screen – see page 16.

Click the  button to change the selection if required and select the Beta ratio.

Pressure Rating   D1 : PN 10

Displays the 'Pressure Rating' selected in the 'Calculation' screen – see page 11.

Ensure that the appropriate flange standard that the OriMaster is to be mounted between is selected to ensure the correct centralizing tool is supplied with the meter.

Click the  button to change the selection if required and select the Beta ratio.

DP Span Limits  

If the calculated 'DP Span Limits' value is within the range for the selected 'Beta' value (see page 16) the calculated DP span limits are displayed automatically.

If the calculated 'DP Span Limits' value **is not** within the range for the selected 'Beta' value (see Note on page 16) select the required DP span limits value.

Note.

- Unavailable options are highlighted in red.
- To ensure optimum flow measurement accuracy, the maximum application DP must be as close as possible to the maximum capacity of the flow element.

Transmitter Seal Material  

Note. If 'Model' is set to 'V : Volume Flow (OriMaster V)', 'Transmitter Seal Material' is set automatically to '0 : Without Seal'

Select the required seal material:

- 0 : Without Seal – OriMaster M and OriMaster V
- 3 : Viton – OriMaster M only
- 4 : PTFE – OriMaster M only (standard material)
- 5 : EPDM – OriMaster M only
- 6 : Perbunan – OriMaster M only

Temperature Element  

Note. Applicable only to OriMaster M. If 'Model' is set to 'V : Volume Flow (OriMaster V)', 'Temperature Element' is set automatically to 'Y : None'.

Select the required temperature element:

- C : Integral – RTD included within the meter body
- R : Remote – RTD ordered separately and mounted into the pipeline

Integrated Digital Display (LCD) 

Select the required display:


- 0 : None (Blind) – OriMaster V and OriMaster M
- 1 : With Integrated LCD Display – OriMaster V only
- 2 : With Integrated LCD Display (Backlit)– OriMaster M only

Electronic Housing Material / Electrical Connection 

Select the required electronic housing material/electrical connections:

- A : Aluminium Alloy / 1/2-14 NPT– OriMaster M only
- B : Aluminium Alloy / M20 x 1.5 – OriMaster M only
- H : AISI 304L SST / 1/2-14 NPT – OriMaster V only
- L : AISI 304L SST / M20 x 1.5 – OriMaster V only
- S : AISI 316L SST / 1/2-14 NPT – OriMaster M and OriMaster V
- T : AISI 316L SST / M20 x 1.5 – OriMaster M and OriMaster V

All models have 316L/Hastelloy wetted parts as standard.

Output Signal 

Note. If 'Model' is set to 'V : Volume Flow (OriMaster V)', 'Output Signal' is set automatically to '1 : HART digital communication and 4 ... 20 mA'.

Select the required output combination:

- 1 : HART digital communication and 4 ... 20 mA– OriMaster M and OriMaster V
- 2 : PROFIBUS PA – OriMaster M only
- 3 : FOUNDATION Fieldbus – OriMaster M only
- 5 : MODBUS RS485 – OriMaster M only

The remaining selections are optional – select only those that are required (if any)

Note. As standard, all OriMaster flow meters are supplied ready for safe area operation. Therefore a selection in this field is necessary only if Ex certification is required.

Select the required Ex certification:


- EA : Factory Mutual (FM) - Intrinsically Safe – OriMaster M only
- EB : Factory Mutual (FM) - Explosion Proof – OriMaster M only
- EE : Canadian Standard Association - Explosion Proof – OriMaster M only
- EN : ATEX + FM + CSA – OriMaster V only
- EW : ATEX II 1/2 GD EEx ia + ATEX II 1/2 GD EEx d + ATEX EEx nL – OriMaster M only

As standard, OriMaster is not flow calibrated.

- If higher accuracy is required select 'CW : Standard Water Calibration at Reference Conditions'.
- If special calibration is required, select 'CZ : Other' and contact ABB with the calibration requirements.

Note. Price and/or delivery information for specially calibrated OriMaster flow meters is available only on application.

As standard, material certificates are not supplied with OriMaster.

- For material certificates to 3.1 select 'C2 : Material monitoring with inspection certificate 3.1 acc EN 10204'
- For material certificates to NACE and 3.1 select 'CN : Material monitoring NACE MR 01-75 with inspection certificate 3.1. acc EN 10204'






As standard, OriMaster is supplied for use in horizontal pipelines.

If OriMaster is to be used in a vertical pipeline with upwards flow direction, select 'VE : Vertical'.



If the calculated 'DP Span Limits' value (see page 19) is within the range for the selected 'Beta' value (see page 16) the calculated 'Measuring Range' value is displayed automatically.

Click the  button and enter a new DP full scale flow value if required (the value at 20 mA output). Select the units and click .

If the calculated 'DP Span Limits' value **is not** within the range for the selected 'Beta' value (see Note on page 16), enter a the DP full scale flow value required (the value at 20 mA output). Select the units and click .

Click the  button or click  Calculation  to return to the 'Calculation' screen

or

Click the  button or click  Project data  to advance to the 'Project data' screen.

4.5 Project Data

Completion of the fields in the 'Project Data' screen (Fig. 4.4) is optional but enables the user to cross-reference the calculation to data on a client, project, quote or order reference.

The information is stored in all associated saved files, can be exported in all the export formats and included in all printed summaries if required.

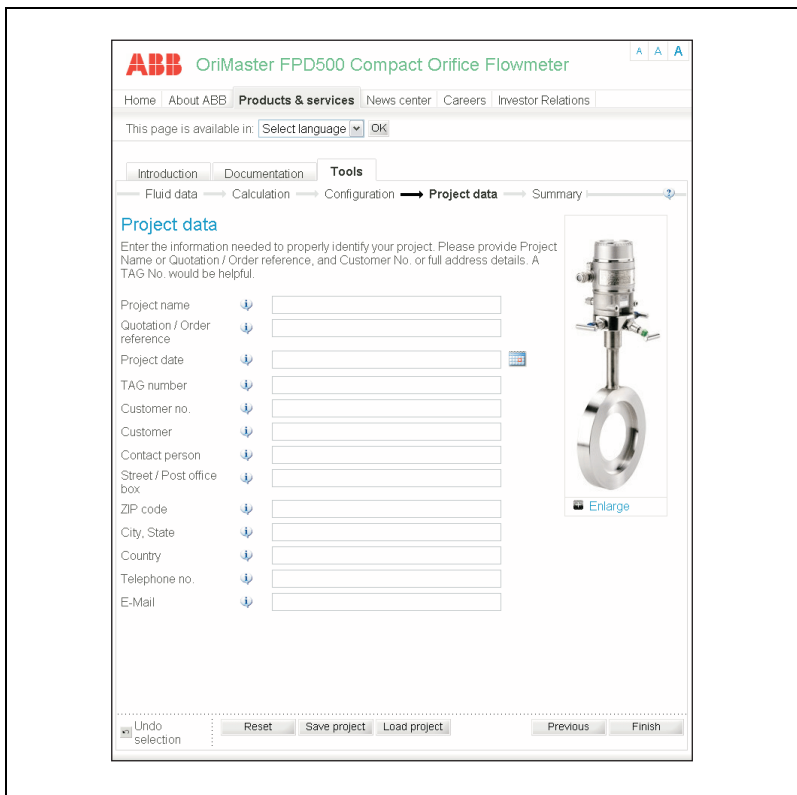


Fig. 4.4 Project Data Screen

Click the **Previous** button or click **Configuration** to return to the 'Configuration' screen
or

Click the **Finish** button or click **Summary** to advance to the 'Summary' screen.

4.6 Summary

The 'Summary' screen displays the collated Fluid Data, Calculation, Configuration and Project Data information – see Fig. 4.5.

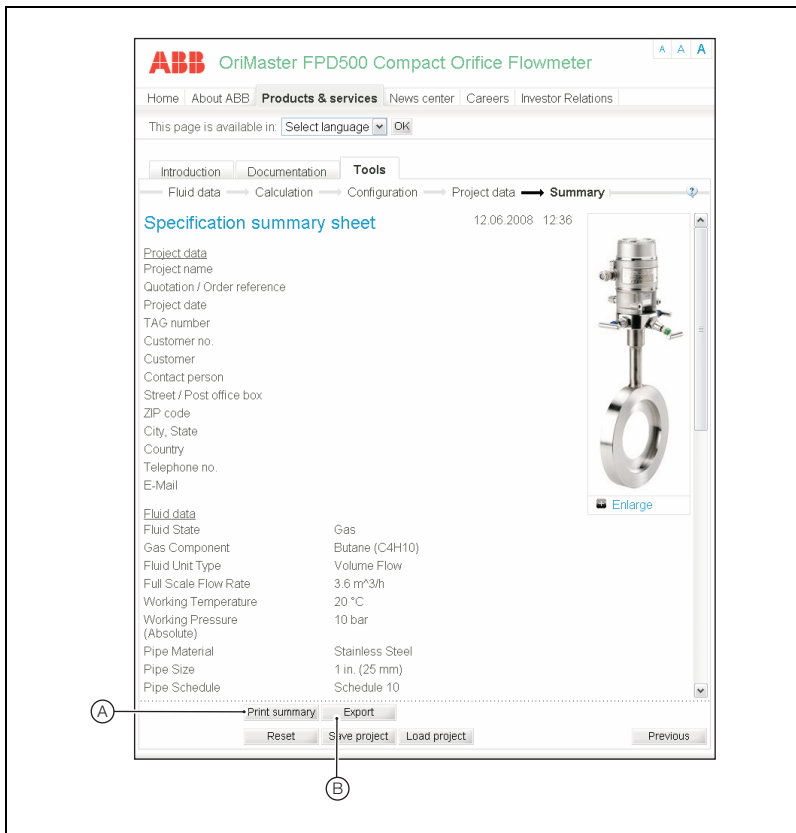


Fig. 4.5 Summary Screen

Click the **Print summary** button (A) to export the information as a pdf file that can be saved, opened or printed.

Click the **Export** button (B) to display a screen from where one of two export formats can be selected:

- Excel – the data is formatted as a Microsoft® Excel spreadsheet that can be saved, opened or printed.
- XML – the data is formatted into XML for interfacing with other ABB data systems.

PRODUCTS & CUSTOMER SUPPORT

Products

Automation Systems

- for the following industries:
 - Chemical & Pharmaceutical
 - Food & Beverage
 - Manufacturing
 - Metals and Minerals
 - Oil, Gas & Petrochemical
 - Pulp and Paper

Drives and Motors

- AC and DC Drives, AC and DC Machines, AC Motors to 1kV
- Drive Systems
- Force Measurement
- Servo Drives

Controllers & Recorders

- Single and Multi-loop Controllers
- Circular Chart and Strip Chart Recorders
- Paperless Recorders
- Process Indicators

Flexible Automation

- Industrial Robots and Robot Systems

Flow Measurement

- Electromagnetic Flowmeters
- Mass Flowmeters
- Turbine Flowmeters
- Wedge Flow Elements

Marine Systems & Turbochargers

- Electrical Systems
- Marine Equipment
- Offshore Retrofit and Refurbishment

Process Analytics

- Process Gas Analysis
- Systems Integration

Transmitters

- Pressure
- Temperature
- Level
- Interface Modules

Valves, Actuators and Positioners

- Control Valves
- Actuators
- Positioners

Water, Gas & Industrial Analytics Instrumentation

- pH, Conductivity and Dissolved Oxygen Transmitters and Sensors
- Ammonia, Nitrate, Phosphate, Silica, Sodium, Chloride, Fluoride, Dissolved Oxygen and Hydrazine Analyzers
- Zirconia Oxygen Analyzers, Katharometers, Hydrogen Purity and Purge-gas Monitors, Thermal Conductivity

Customer Support

We provide a comprehensive after sales service via a Worldwide Service Organization. Contact one of the following offices for details on your nearest Service and Repair Centre.

UK

ABB Limited
Tel: +44 (0)1946 830 611
Fax: +44 (0)1946 832 661

USA

ABB Inc.
Tel: +1 215 674 6000
Fax: +1 215 674 7183

Client Warranty

Prior to installation, the equipment referred to in this manual must be stored in a clean, dry environment, in accordance with the Company's published specification.

Periodic checks must be made on the equipment's condition. In the event of a failure under warranty, the following documentation must be provided as substantiation:

1. A listing evidencing process operation and alarm logs at time of failure.
2. Copies of all storage, installation, operating and maintenance records relating to the alleged faulty unit.

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Printed in UK (07.08)

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