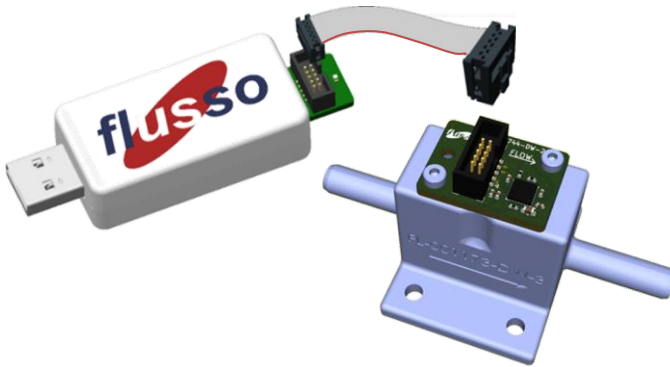
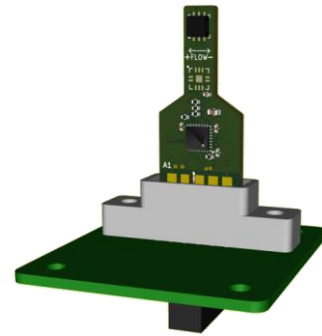


1 FLS1xx evaluation kit hardware and Windows GUI

FLS1xx Series evaluation kits can be requested through the Flusso web site or purchased from distributors listed there. Your evaluation kit is assembled, tested and calibrated by us before shipping, so you can quickly start trying out a real FLS1xx flow sensing solution. This is what's in the box:

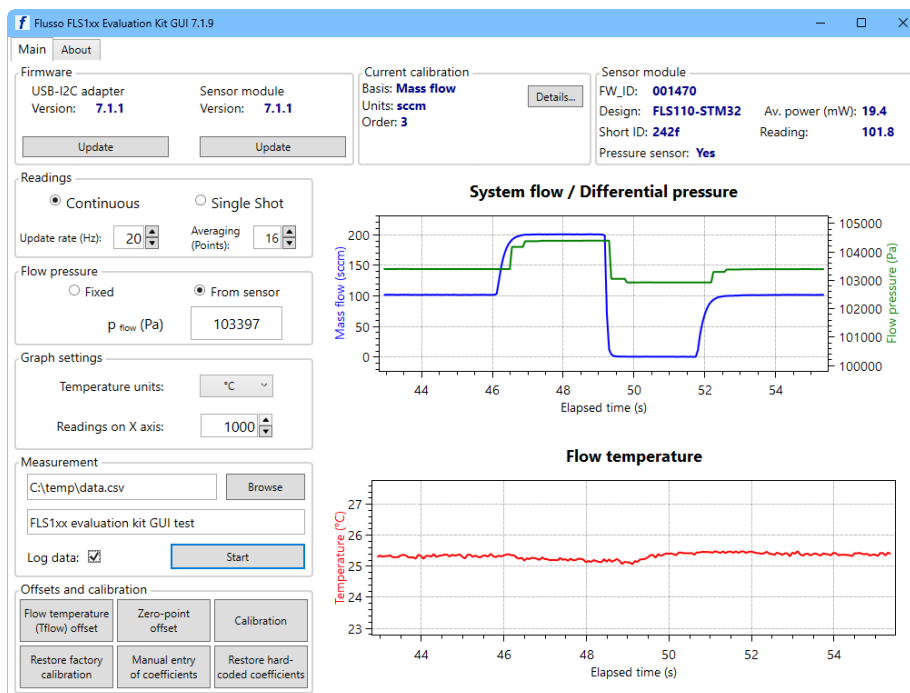


A number of **FLS110** evaluation kits are available with different fluidic fixtures (see section 4). This one is FLS-110-EK-1173. Choose a kit with a fixture that most closely matches your application requirements.



FLS122 air velocity sensor evaluation kits don't have a fluidic fixture (see section 3). They have a sensor electronics module and an adapter PCB for connecting the ribbon cable. This one is FLS-122-EK-1982.

The *FLS1xx Series Flow Sensor Evaluation Kit GUI* for Windows 10/11 GUI is available to download from the Flusso [customer portal](#). It works with the sensor electronics modules of all FLS1xx evaluation kits.



Please refer to these documents for more information:

- Developing Digital Flow Measurement Solutions With FLS1xx Series Sensors (FL-000986-TN)
- FLS1xx Series Flow Sensor Evaluation Kit User Guide (FL-000956-UG)
- FLS110 Miniature Gas Flow and Differential Pressure Sensor Datasheet (FL-000038-DS)
- FLS122 Air Velocity Sensor Datasheet (FL-002202-DS)

2 USB to I²C-bus™ adapter and ribbon cable

All FLS1xx evaluation kits are supplied with a USB to I²C-bus™ adapter and ribbon cable, as shown in Figure 1. Both items are also available as spare parts.

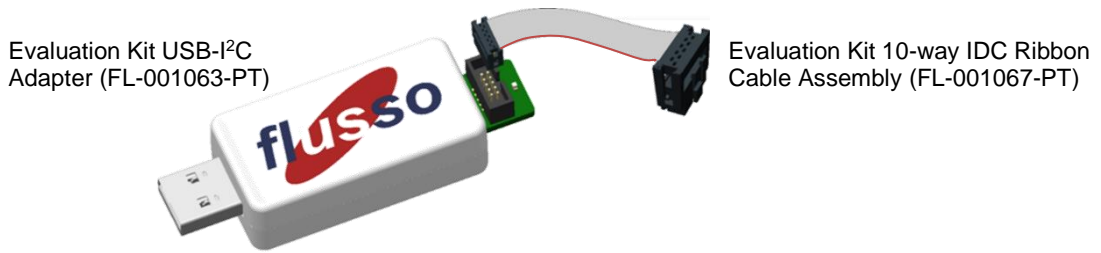
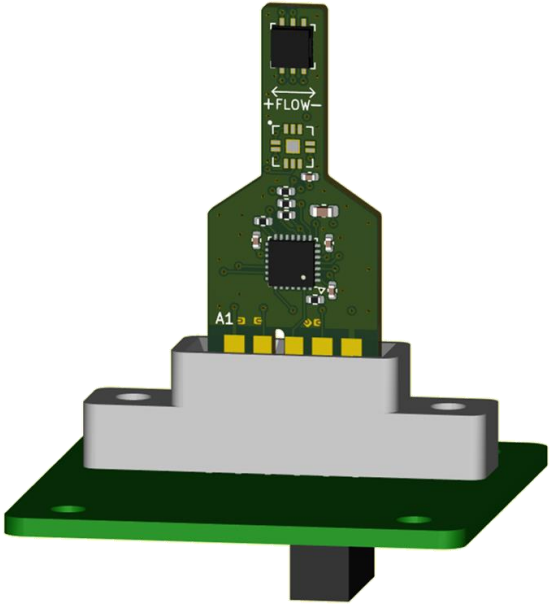
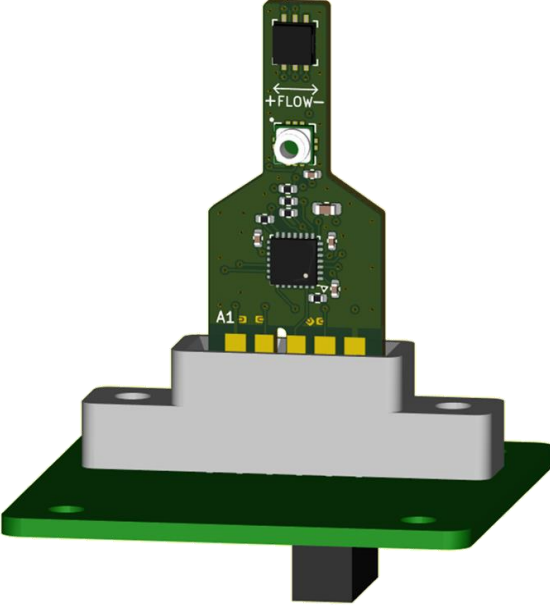


Figure 1: FLS1xx evaluation kit USB-I²C adapter and ribbon cable assembly

3 FLS122 evaluation kit selection

FLS122 evaluation kits are shown in Table 1, below. If you want the evaluation kit GUI to automatically measure flow pressure in your system, choose one with a pressure sensor fitted. The sensor electronics modules are shown mounted in *FLS122-STM32-XT Extended Air Velocity Sensor Electronics Module Adapter PCB* (FL-002089-DW). The adapter transitions from the FLS122 PCB edge connections to the 10-way header so you can connect up using the Flusso USB-I²C adapter (see section 2). The sensor electronics module PCB design files *FLS122-STM32-XT Extended Air Velocity Sensor Electronics Module PCB* (FL-001966-DW) are available to download from the Flusso [customer portal](#).

Table 1: FLS122 evaluation kits


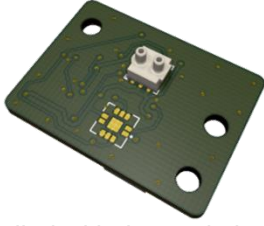
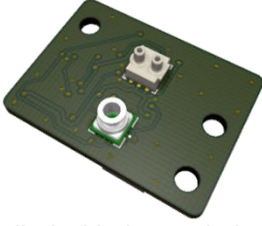
FLS-122-EK-1982	FLS-122-EK-2023
	
<p>The sensor electronics module in this kit is FL-001982-PT <i>FLS122-STM32-XT Extended Air Velocity Sensor Electronics Module</i></p>	<p>The sensor electronics module in this kit is FL-002023-PT <i>FLS122-STM32-XT Extended Air Velocity Sensor Electronics Module <u>with Pressure Sensor</u></i></p>

4 FLS110 evaluation kit selection

Select an FLS110 evaluation kit from Table 2 according to fixture type, your flow (or differential pressure) range of interest, and whether or not you want the GUI to measure flow pressure automatically. Pictures and more details about the different fluidic fixtures are provided in Table 3 on pages 4 to 7. The fixtures have unique product codes of their own embossed on the side, so you can check exactly what you have received. All FLS110 evaluation kits are supplied with a USB-I2C adapter and ribbon cable assembly. Design files are available to download from the Flusso [customer portal](#):

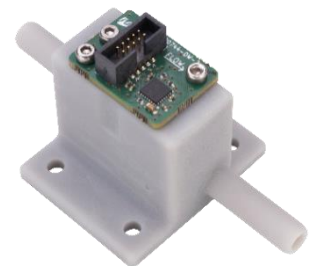
- FLS110-STM32 Flow Sensor Electronics Module Reference Design PCB (FL-000744-DW)
- FLS11x Flow Sensor Evaluation Kit Fluidic Fixture Design Files (FL-002569-DW)

Table 2: FLS110 evaluation kit selector

FLS110-STM32 sensor electronics module		Sensor module FL-001068-PT without flow pressure sensor	Sensor module FL-001168-PT with flow pressure sensor
 <p>PCB design reference FL-000744-DW, top side.</p>		 <p>Supplied with the evaluation kits listed in this column, below</p>	 <p>Supplied with the evaluation kits listed in this column, below</p>
guiFixture type	Nominal range	Evaluation kit product code	Evaluation kit product code
Through-flow / DP	200 sccm / 500 Pa	FLS-110-EK-630 inline ports FLS-110-EK-771 parallel ports	FLS-110-EK-1173 inline ports FLS-110-EK-1391 parallel ports
Viscous bypass	5 slm	FLS-110-EK-673	FLS-110-EK-1174
	10 slm	FLS-110-EK-674	FLS-110-EK-1237
	25 slm	FLS-110-EK-675	FLS-110-EK-1238
	50 slm	FLS-110-EK-676	FLS-110-EK-1240
	100 slm	FLS-110-EK-677	FLS-110-EK-1242
	250 slm	FLS-110-EK-678	FLS-110-EK-1243
500 slm	FLS-110-EK-679	FLS-110-EK-1244	FLS-110-EK-1244
Venturi	500 slm	FLS-110-EK-622	FLS-110-EK-1392

Using the FLS11x fluidic fixtures

FLS11x fluidic fixtures are 3D-printed in Accura® Xtreme™ grey material from 3D Systems Corporation (<https://www.3dsystems.com/>). No surface coating is applied. We have used this material successfully for testing at temperatures from 0 °C to +50 °C but it is not suitable for more extreme temperatures or long-term use – discolouration and embrittlement is to be expected with aging.



When connecting/disconnecting the fluidic fixtures to/from your test set-up beware of creating or disturbing dust that could be carried into the FLS110 by the flow and adversely affect sensing performance. Push-fit pneumatic connectors are very convenient but often have metal inserts to grip the tube, which scratch the surface and create dust. We recommend leaving them in place once fitted to the fixture.






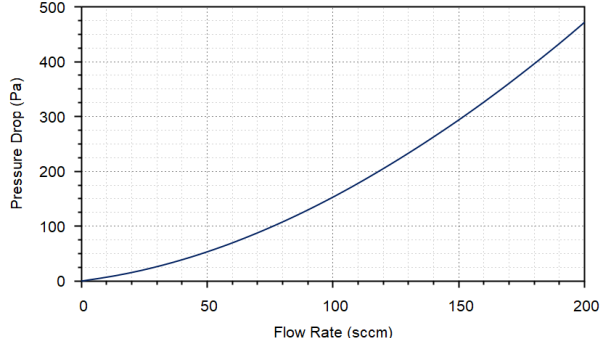


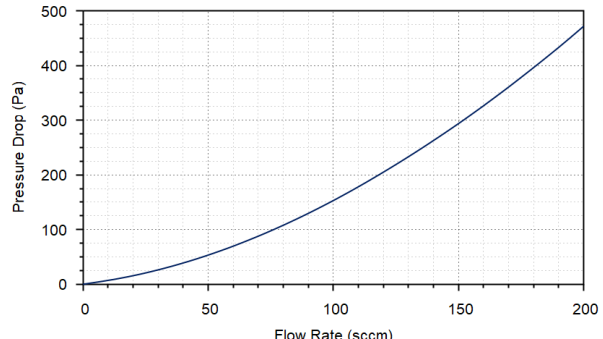
Avoid ingress of liquids; flow / DP readings will be incorrect and the FLS110 might be damaged.



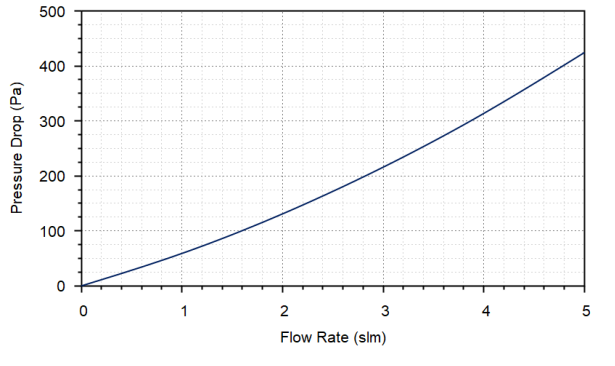


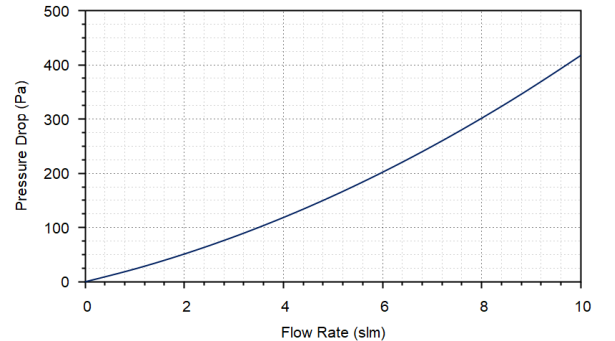


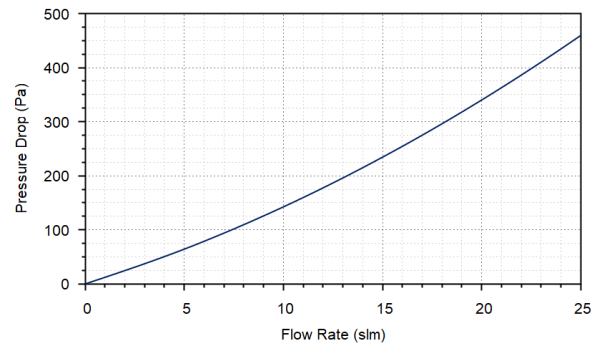
FLS110 ports are sealed into fixtures using O-rings. If you need to replace them, we recommend Nitrile 50 ShA or 70 ShA, 1 mm inside diameter, 0.5 mm cross section. The ones we fit are available as spares:



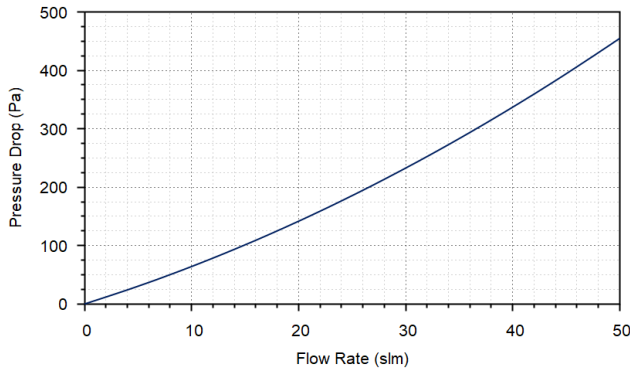


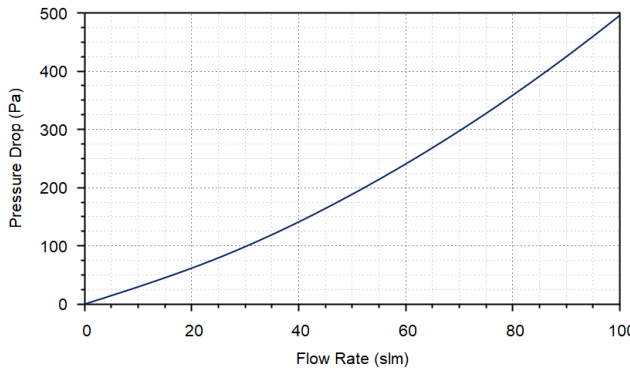


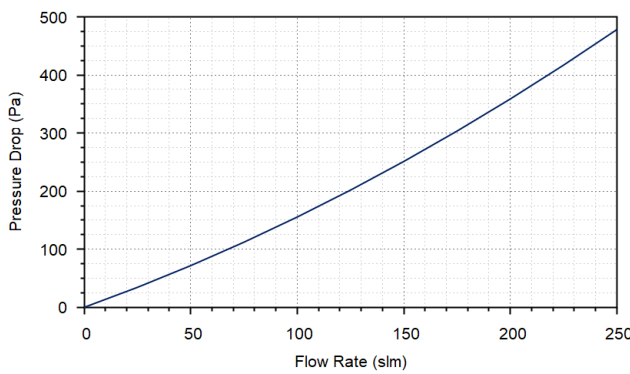
- FLS11x Eval Kit Fixture O-Ring 1mm ID x 0.5mm CS Nitrile 70 ShA (FL-001115-PT)
- FLS11x Eval Kit Fixture O-Ring 1mm ID x 0.5mm CS Nitrile 50 ShA (FL-001585-PT)



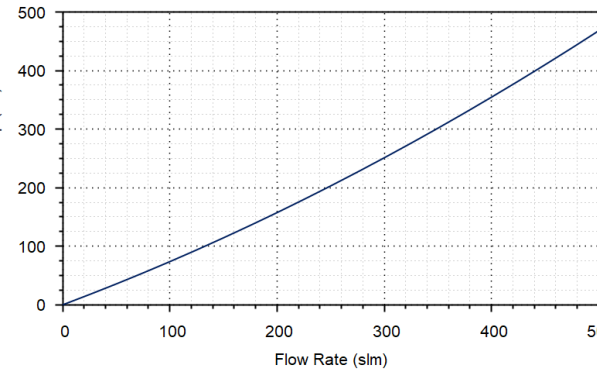


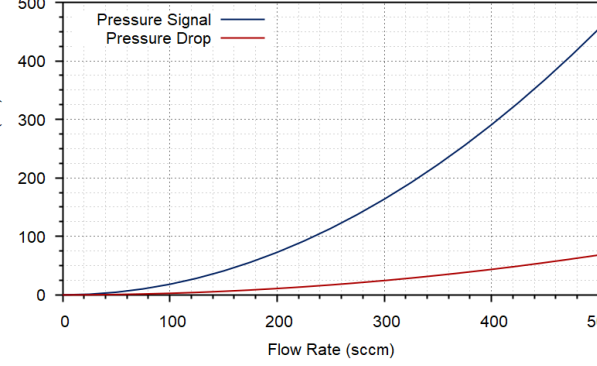
Table 3: Fluidic fixture details for the different FLS110 evaluation kits

Below the evaluation kit product code **FLS-110-EK-xxxx** we show the fluidic fixture product code **FL-xxxxxx-DW** and envelope dimensions (L x W x H)

FLS110-STM32 sensor electronics module	Sensor module FL-001068-PT No pressure sensor fitted	Sensor module FL-001168-PT Pressure sensor fitted	Notes
 <p>PCB design reference FL-000744-DW, top side.</p>	 <p>Used with evaluation kits and fixtures listed in this column</p>	 <p>Used with evaluation kits and fixtures listed in this column</p>	<p>FLS110 datasheet performance specifications are based on through-flow measurements using these FLS110-STM32 reference design modules, running standard firmware .</p> <p>For more details see:</p> <ul style="list-style-type: none"> • <i>FLS1xx Hardware Design Guide</i> (FL-000607-TN) • <i>FLS1xx Firmware Guide</i> (FL-000939-TN) <p>Both types of sensor module (shown on the left) are built on the same PCB – reference FL-000744-DW.</p>
Evaluation kits and fixtures	Without pressure sensor port	With flow pressure sensor port	Typical characteristic
<p>Evaluation kit product code: Fluidic fixture (size): Type Through-flow, DP Range 200 sccm, 500 Pa Port OD 6 mm</p>	<p>FLS-110-EK-630 FL-000630-DW (70 x 30 x 27 mm)</p> 	<p>FLS-110-EK-1173 FL-001173-DW (70 x 36 x 27 mm)</p> 	
<p>Evaluation kit product code: Fluidic fixture (size): Type Through-flow, DP Range 200 sccm, 500 Pa Port OD 6 mm</p>	<p>FLS-110-EK-771 FL-000771-DW (24 x 10 x 30 mm)</p> 	<p>FLS-110-EK-1391 FL-001391-DW (24 x 16 x 30 mm)</p> 	

Evaluation kits and fixtures	Without pressure sensor port	With flow pressure sensor port	Typical characteristic
<p>Evaluation kit product code: Fluidic fixture (size): Type Bypass – viscous Range 5 slm Port OD 6 mm</p>	<p>FLS-110-EK-673 FL-000673-DW (59 x 24 x 20 mm)</p> 	<p>FLS-110-EK-1174 FL-001174-DW (59 x 30 x 20 mm)</p> 	
<p>Evaluation kit product code: Fluidic fixture (size): Type Bypass – viscous Range 10 slm Port OD 6 m</p>	<p>FLS-110-EK-674 FL-000674-DW (61 x 24 x 16 mm)</p> 	<p>FLS-110-EK-1237 FL-001237-DW (61 x 30 x 16 mm)</p> 	
<p>Evaluation kit product code: Fluidic fixture (size): Type Bypass – viscous Range 25 slm Port OD 10 mm</p>	<p>FLS-110-EK-675 FL-000675-DW (98 x 24 x 19 mm)</p> 	<p>FLS-110-EK-1238 FL-001238-DW (98 x 30 x 19 mm)</p> 	

Evaluation kits and fixtures	Without pressure sensor port	With flow pressure sensor port	Typical characteristic
<p>Evaluation kit product code: Fluidic fixture (size): Type Bypass – viscous Range 50 slm Port OD 13 mm</p>	<p>FLS-110-EK-676 FL-000676-DW (133 x 17 x 27 mm)</p> 	<p>FLS-110-EK-1240 FL-001240-DW (133 x 23 x 27 mm)</p> 	
<p>Evaluation kit product code: Fluidic fixture (size): Type Bypass – viscous Range 100 slm Port OD 16 mm</p>	<p>FLS-110-EK-677 FL-000677-DW (133 x 17 x 27 mm)</p> 	<p>FLS-110-EK-1242 FL-001242-DW (133 x 30 x 27 mm)</p> 	
<p>Evaluation kit product code: Fluidic fixture (size): Type Bypass – viscous Range 250 slm Port OD 25 mm</p>	<p>FLS-110-EK-678 FL-000678-DW (205 x 26 x 33 mm)</p> 	<p>FLS-110-EK-1243 FL-001243-DW (205 x 26 x 33 mm)</p> 	

Evaluation kits and fixtures	Without pressure sensor port	With flow pressure sensor port	Typical characteristic
<p>Evaluation kit product code: Fluidic fixture (size): Type Bypass – viscous Range 500 slm Port OD 25 mm</p>	<p>FLS-110-EK-679 FL-000679-DW (225 x 30 x 37 mm)</p> 	<p>FLS-110-EK-1244 FL-001244-DW (225 x 30 x 37 mm)</p> 	
<p>Evaluation kit product code: Fluidic fixture (size): Type Bypass – venturi Range 500 slm Port OD 25 mm</p>	<p>FLS-110-EK-622 FL-000622-DW (200 x 25 x 33 mm)</p> 	<p>FLS-110-EK-1392 FL-001392-DW (200 x 25 x 33 mm)</p> 	 <p>Venturi pressure signal is greater than the system pressure drop</p>