

Dewpoint sampling cells for DRYCAP® products

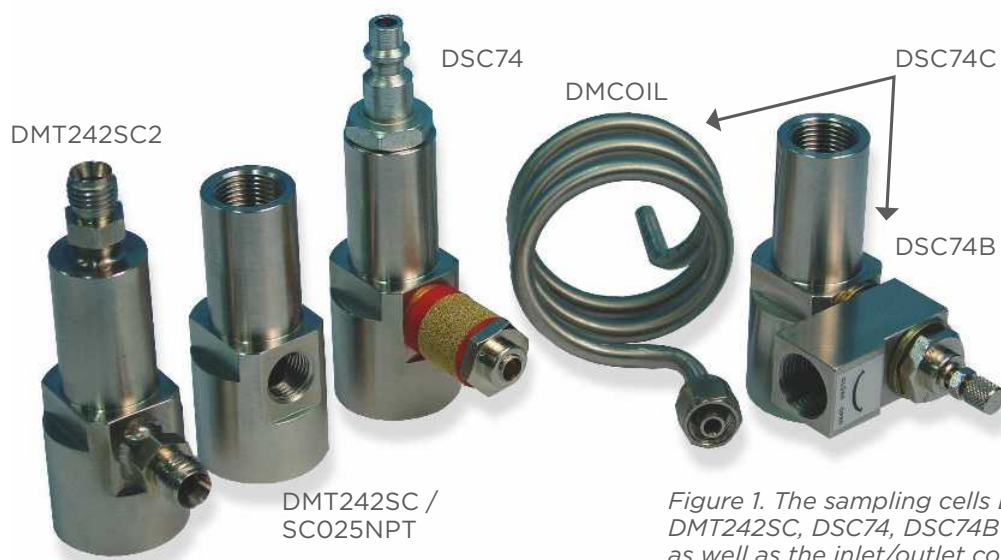


Figure 1. The sampling cells DMT242SC2, DMT242SC, DSC74, DSC74B and DSC74C as well as the inlet/outlet coil DMCOIL.

This technical note provides information for installing and operating Vaisala sampling cells DMT242SC, DMT242SC2, DSC74, DSC74B, DSC74C, DMCOIL.

Overview

All Vaisala Sample Cells use G1/2" ISO parallel threads for the probe connection point.

A sealing ring must be used between the mated surfaces of the sample cell and a probe or transmitter with a parallel ISO threaded fitting body*. Sealing rings are either single use copper (P/N: 221524SP) or multi-use metal/rubber (P/N: 221525SP). See instrument User Guide for specific torque specifications for installation (max 50 Nm).

All Sample Cells have a 10bar operating pressure limit.

Sealing rings

The sampling cells are compatible with the following Vaisala meters and transmitters:

- DM70 (DMP74 A/B/C)
- DMT143(L)
- DMT152
- DMT347 / DMT348
- DMP7 / DMP8*
- DPT146

*) The DMT348 and DMP8 have a tapered ISO thread, while the sampling cell has a straight thread. The construction of this combination works to the 10bar operating pressure limit.



Single Use: P/N: 221524SP



Multi Use: P/N: 221525SP

General considerations

Sampling cells are needed when direct measurement of the air or gas is not possible or desirable. This may be related to, for example, a high process temperature,

protecting the sensor from water spikes, the need to easily detach the instrument from a pressurized process without running the whole process down, or wanting to make the measurement at a more convenient location. These factors

also relate to the calibration of installed instruments.

For more information, visit **Vaisala.com**

Sampling cell models

DMT242SC & SC025NPT Sampling Cell - basic sample cell

The DMT242SC and SC025NPT are a basic sample cell with only the main sampling cell body. The inlet and outlet are female threaded sample connectors. DMT242SC have inlet G3/8", outlet G1/4" ISO, and the SC025NPT has 1/4"NPT inlet and 1/4"NPT outlet.

The DMT242SC and SC025NPT are suitable for users requiring only a sampling cell to fit the probe into and doing further assembly (piping into inlet & outlet, valves, possible flow meter) by themselves.



- 1 = G1/4" or 1/4"NPT
- 2 = G3/8" or 1/4" NPT

DMT242SC2 Sampling cell - fits 1/4" tubing

The DMT242SC2 is similar to DMT242SC, but connections are made easy. The sampling cell includes welded swagelok connectors at both the inlet and outlet that fit directly to 1/4" tubing.

To fit 6 mm tubing to the connectors, an adapter such as Swagelok® Reducer SS-6M0-R-4 (not supplied by Vaisala) can be used.

DMT242SC2 is the suitable choice in e.g. plastics drying systems, where the measurement is made by tapping off the dryer system and bringing a small air stream to the sensor. The swagelok connectors of DMT242SC2 easily connect to a cooling coil or tubing providing the essential function of cooling the dry air to ambient temperature before it reaches the sensor.

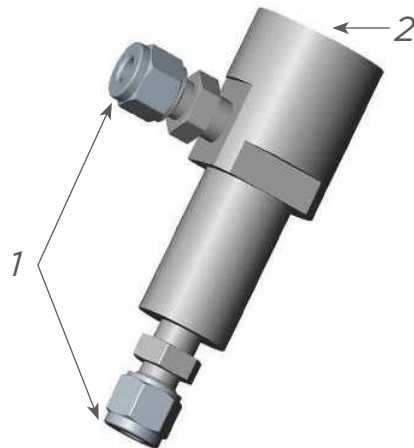


Figure 4. Sampling cells DMT242SC2 (left) and DMT242SC (right)

- 1 = Male pipe welded connector Swagelok 1/4"
- 2 = G1/2"

DSC74 Sampling cell with leak screw

The DSC74 has been designed especially for compressed air lines. The sampling cell contains an adjustable leak screw that allows keeping up the pipeline pressure at the sensor. The leak

screw is opened and closed with a screwdriver. The leak screw should be 1/2 turn open. This can be verified by first closing the leak screw, then turning 1/2 turn to open it. Then the air coming out will make a hardly audible little fizz and it can be lightly felt when putting a hand in front of the air stream.

The DSC74 comes with a quick connector that fits to the industry standard compressed air line connectors. This allows for easy installation and detachment of the dewpoint transmitter without having to shut down the process. Alternative ways to connect are through the two different thread adapters (G3/8" to G1/2" and G3/8" to G1/4" ISO) that are supplied with each DSC74 unit.

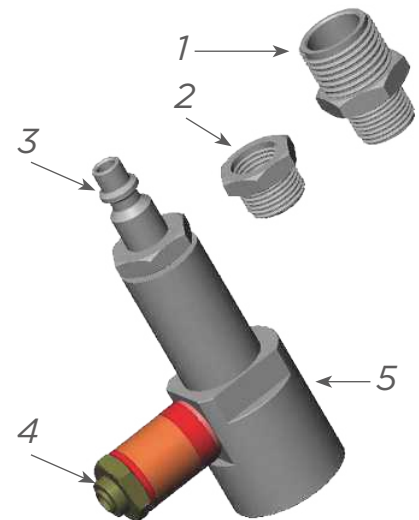


Figure 5. DSC74 Sampling Cell with the Adapters

- 1 = Thread adapter type G3/8" - G1/2"
- 2 = Thread adapter type G3/8" - G1/4"
- 3 = Quick connector NIP08, type D
- 4 = Leak screw
- 5 = Sampling cell body (DMT242SC)

DSC74B and DSC74C – two pressure sampling cells

The DSC74B and DSC74C sample cells are enhanced versions of the DSC74. The body is designed in a way that it is possible to measure at both system pressure and atmospheric pressure.

DSC74B

The DSC74B limits the flow rate with a fixed leak screw. The flow is optimized for pressures 3...10 barg. The fixed leak screw eliminates the risk of opening the leak screw fully by accident and this way emptying a gas vessel. The maximum flow can be increased, if needed, by removing the leak screw and adjusting the flow manually with the valve. Harmful gases can be recovered by connecting a collection system at the outlet (not available from Vaisala).

In the basic operation of the DSC74B, the gas flows to the sensor from the front and the outlet is on the side. To have the measurement done at atmospheric pressure, the inlet and outlet are reversed. Then the reducing parts supplied (G3/8" - G1/2" or G3/8" - G1/4") on the outlet side help to protect the sensor from ambient humidity coming in.

DSC74B parts are:

- sampling cell, thread 3/8"G
- connection part with a needle valve and an integrated leak screw
- Reducing Nipple (thread adapter), G3/8" - G1/2"
- Reducing Adapter (thread adapter), G3/8" - G1/4"

DSC74C

The DSC74C with an outlet coil is designed for the most critical measurements at atmospheric pressure. In the DSC74C the coil is connected to the sampling cell outlet to protect the sensor from ambient humidity disturbing the measurement.

DSC74C parts are:

- sampling cell, thread G3/8"
- connection part with a needle valve and an integrated leak screw
- Reducing Nipple (thread adapter), G3/8" - G1/2"
- Reducing Adapter (thread adapter), G3/8" - G1/4"
- diffusion coil (for measurements in atmospheric pressure)

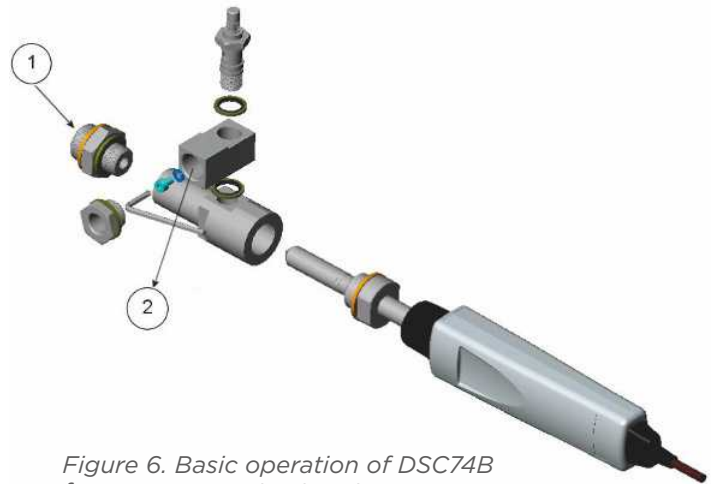


Figure 6. Basic operation of DSC74B for measurements at system pressure

- 1 = Gas goes in
2 = Gas comes out

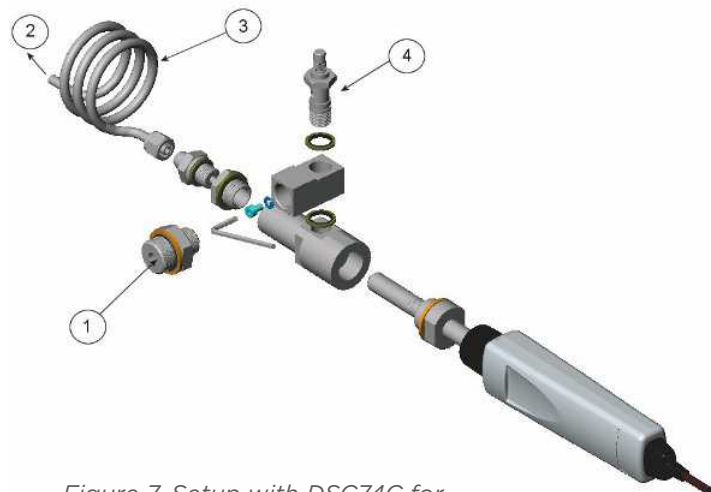


Figure 7. Setup with DSC74C for measurements at atmospheric pressure.

- 1 = Gas goes in. Also the coil can be used here.
2 = Gas comes out
3 = Coil
4 = Valve

Configuring for measurements at system / atmospheric pressure

Figure 8 illustrates sampling at process or atmospheric pressure with Vaisala sampling cells DSC74, DSC74B and DSC74C.

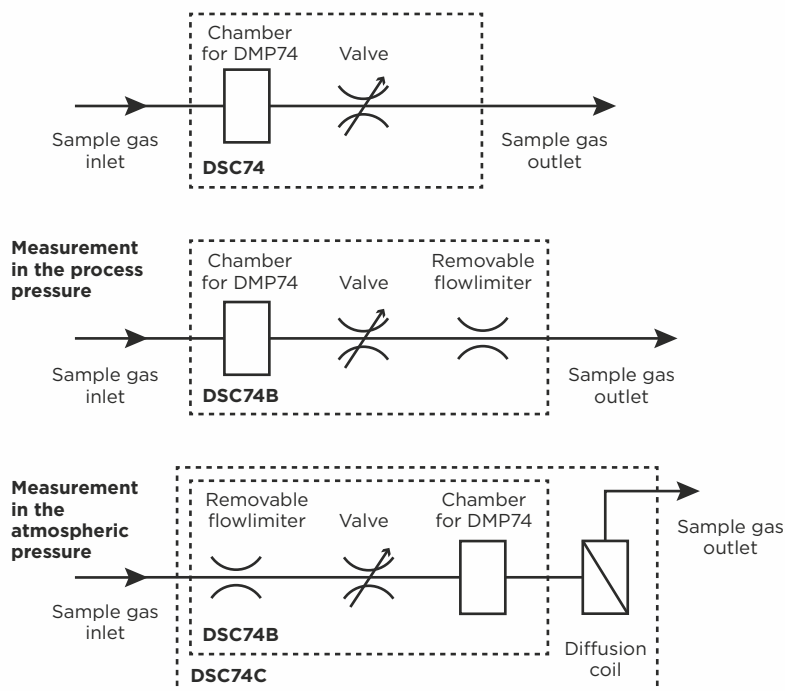


Figure 8. Flow chart of the gas flow when measuring at process vs. atmospheric pressure.



DMCOIL - Stainless steel (AISI316L) coil for sampling cells (DMT242SC, DMT242SC2, DSC74, DSC74B/C)

DMCOIL operation

- Works as cooling coil in gas inlet in high temperature process to cool sample gas temperature down.
- Also acts as venting coil in gas outlet to prevent ambient humidity to disturb low dew point measurement in applications where gas pressure is reduced to ambient pressure prior the sampling cell.

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