



Virtual Fluid Lab (VFL)

Intelligent determination of the filter element's remaining service life

Differential pressure

Element service life for service planning

smart

IO-Link

Description:

The new generation of smart sensors is designed to generate further relevant information in addition to the classic operation data. This ensures the support of dynamic, real-time optimised and self-organising processes, which optimises the availability as well as the resource consumption and reduces operating costs.

The Virtual Fluid Lab VD ... VFL with IO-Link interface was specially developed to provide a solution that can determine the remaining service life of the filter element on the basis of pressure difference measurements.

The sensor does this by using an internal algorithm to convert the filter's pressure signal and the temperature of the fluid (which is read via IO-Link) into the current remaining service life of the filter element. This means that a signal is available that can be used for optimum planning of service work.

After the start-up phase, during which a constant remaining service life is output (9,999 h), the actual calculated remaining service life [h] will be provided to the IO-Link master.

This value decreases linearly as the operating hours of the filter element increase.

The fluid compatibility includes hydraulic oils, lubrication oils and HFD as well as all further environment-friendly fluids¹⁾.

The Virtual Fluid Lab is used in plants where continuous, intelligent monitoring of the remaining service life is needed to enable organised service and to make full use of the filter element's service life. A typical application is installation in a filter housing.

Technical data:

Input data

Measuring ranges	Differential pressure 2, 5, 8 bar
Perm. operating pressure	420 bar
Mechanical connection	G ½ HN 28-22.1
Tightening torque, recommended	100 Nm (steel), 33 Nm (aluminium)
Parts in contact with fluid	Connector: stainless steel O-ring: FKM Profile seal: PTFE

Environmental conditions

Compensated temperature range	+20 °C to +70 °C
Operating temperature range	-30 °C to +85 °C
Storage temperature range	-40 °C to +100 °C

CE marking EN 61000-6-1 / 2 / 3 / 4

Vibration resistance acc. to DIN EN 60068-2-6 at 10 to 500 Hz ≤ 20 g

Shock resistance according to DIN EN 60068-2-29 (1 ms) 50 g

Protection type acc. to DIN EN 60529²⁾ IP 67

IO-Link-specific data

IO-Link revision	V1.1
Transmission rate, baud rate	38.4 kBd (COM2)
Minimum cycle time	10 ms
SIO mode supported	No
Sensor profiles	0x4000 common application profile
M-sequence capability	PREOPERATE = TYPE_1_V with 8 octets on-request data OPERATE = TYPE_2_2 with 8 octets on-request data ISDU supported

Other data

Electrical connection	M12x1, 4-pole
Supply voltage ³⁾	18 to 30 V DC for IO-Link communication operation
Residual ripple of supply voltage	≤ 5%
Current consumption	≤ 25 mA
Service life	> 1 million cycles (max. differential pressure resistance)
Weight	~ 180 g

Note: Reverse polarity protection of the supply voltage, overvoltage, overcurrent and short circuit protection are provided.

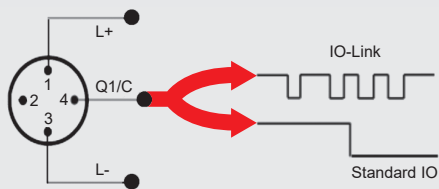
¹⁾ Fluid compatibility with HFC on request

²⁾ With mounted mating connector in corresponding protection class

³⁾ 9 to 35 V DC outside of IO-Link communication operation (e.g. SIO mode without master)

Pin connections:

M12x1, 4-pole



Pin	Signal	Code
1	L+	+U _B
2		Not allocated
3	L-	0 V
4	Q1/C	IO-Link communication

Model code:

VD 5 VFL.x /-V-I4M020

Type

VD = measurement of differential pressure

Measuring ranges in bar

2, 5, 8

Version

VFL = Virtual Fluid Lab

Modification number

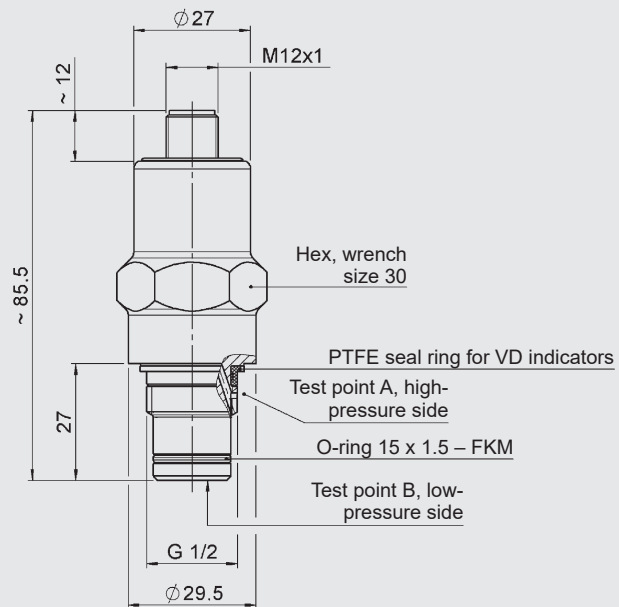
X = the latest version is always supplied

Supplementary details

V = FKM seal

I4M020 = IO-Link, 4-pole, M12x1

Dimensions:



Note:

The information in this brochure relates to the operating conditions and applications described. For applications and/or operating conditions not described please contact the relevant technical department.

Subject to technical modifications.

HYDAC FILTERTECHNIK GMBH
 Industriegebiet
D-66280 Sulzbach/Saar
 Tel. +49 (0)6897 509-01
 Fax +49 (0)6897 509-300
 E-mail: filter@hydac.com
 Internet: www.hydac.com