

# DFL Sensors

## Fuel Flow Meters

Type CDFL1A..., CDFL3A...

DFL sensors are especially designed for fuel consumption measurement in mobile vehicle testing.

- Very simple installation
- High measurement resolution
- Suitable for all current fuel supply systems, with or without return flow
- Suited for gasoline, diesel, bio-diesel and alcohol fuel
- Viton® hoses and sealings, leakage-protected quick couplings
- Signal outputs: Analog, Digital, CAN-Bus, USB and RS-232C

### Description

DFL sensors are developed for quick and easy fuel consumption measurement. Small dimensions and little weight enable the devices to be installed in almost any vehicle for mobile testing. The sensors are also designed for test bench applications, like the use on power analyzers or engine dynamometers. Today's DFL devices suit all kinds of consumption measurement with gasoline, diesel, alcohol based and bio fuels due to easy handling, robust and durable construction and also due to unique quality. An external signal processor that is included in the scope of delivery reads the measured data from the sensor and provides different outputs for the user's data acquisition.

### Application

The field of applications covers fuel consumption testing with engines of passenger cars, trucks, heavy duty and specialized vehicles, motorbikes and ships. The devices can be used mobile in vehicles as also stationary at the test bench. The DFL systems fit to almost all fuel systems.

DFL1x-5bar sensors suit installation in vehicles with only one feed line to the engine with no return line to the tank.

DFL3x-5bar sensors suit installation in vehicles with feed line to the engine and return line to the tank.

### Technical Data

Performance Specifications		DFL1x-5bar	DFL3x-5bar
Measuring range (sensor)	l/h	0,5 ... 250	
Flow rate max. (pump)			
at 1 bar	l/h		190
at 5 bar	l/h		120

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This information corresponds to the current state of knowledge. Kistler reserves the right to make technical changes. Liability for consequential damage resulting from the use of Kistler products is excluded.



DFL1x-5bar



DFL3x-5bar

		DFL1x-5bar	DFL3x-5bar
Measurement accuracy (range 1 ... 50 l/h)	%		±0,5
Reproducibility	%		±0,2
Operating pressure max. <sup>1)</sup>	bar		5
Pressure drop	bar		0 ... 0,5
Resolution	cm <sup>3</sup>		0,33

### Signal Outputs<sup>2)</sup>

Digital 1 (act. consumption)	pulses/cm <sup>3</sup>	50 ... 10 000	
Digital 2 (fuel flow)	Hz/l/h	1 ... 10 000	
Digital 5 for connection to a stand-alone display		proportional to Dig 1	
Digital 2 (fuel flow)	V	0 ... 10	
Analog 2 (temp. input) <sup>3)</sup>	V	0 ... 10	
Analog 3 (temp. output) <sup>3)</sup>	V	0 ... 10	
Analog 4 (pressure) <sup>4)</sup>	V	no	0 ... 10

### Interfaces

CAN (Motorola/Intel) <sup>5)</sup>		2.0B
USB (Full Speed)		2.0
RS-232C		yes

### System Specifications

Power supply	VDC	10 ... 28	10 ... 15
Power consumption max.	A	0,2	8
Temperature range	°C	-20 ... 70	
Relative humidity	%	80	
Protection standard		IP34	
Dimensions (LxWxH)	mm	183x106x94	344x193x125
Weight (approx.)	kg	2	9

<sup>1)</sup> built-in pressure regulator with DFL3x-5bar

<sup>2)</sup> of the external signal processor

<sup>3)</sup> only available with option "PT100"

<sup>4)</sup> only available with option "Pressure Sensor, Internal connection"

<sup>5)</sup> actual consumption in: l/100 km; km/l; temp. input; temp. output; pressure; flow rate; total consumption

### Included Accessories

- DFL processor
- Power cable, 2 m
- Signal cable, 5 m
- Connection cable CAN, 2 m
- Connection cable RS-232C, 2 m
- Connection cable USB, 2 m
- Distribution cable, 1 m
- Distribution cable, 1 m
- Diesel connecting set DFL
- Multimedia-CD incl. software & manuals
- DFL sensor calibration
- Transport case, complete

### Type/Art. No.

- KCD15627
- KCD10398
- KCD16732
- KCD13946
- KCD13425
- KCD13947
- KCD16038
- KCD16039
- KCD15608
- KCD11343
- KCD11435
- KCD16528

### Optional Accessories

- Pressure sensors
  - Temperature sensor PT100
  - Temperature sensor K-Type
  - Hose set, ø11,5 mm
  - Connecting set, ø11,5 mm
  - Filter, ø11,5 mm
  - Hose set, ø7,3 mm
  - Connecting set, ø7,3 mm
  - Filter, ø7,3 mm
- further ø on request

### Type/Art. No.

- KCD15807
- KCD15792
- KCD12922
- KCD15633
- KCD15612
- KCD16961
- KCD15609
- KCD15610
- KCD15616

### Additional for DFL3x-5bar Sensoren

- Power cable, 5 m
- Manometer with quick coupling, ±1 bar
- Manometer with quick coupling, max. 5 bar
- Hose with inline filter, 1 m
- Connecting hose Viton, ø11,5 mm

### Type/Art. No.

- KCD10397
- KCD15910
- KCD15614
- KCD16032
- KCD16005

### Additional for DFL1x-5bar (optional)

- Pressure regulator

### Type/Art. No.

- KCD15638

### Additional for DFL-WTx-5bar (optional)

- Power cable, l = 5 m
- Manometer with quick coupling, ±1 bar
- Manometer with quick coupling, max. 5 bar
- Pressure regulator

### Type/Art. No.

- KCD10397
- KCD15910
- KCD15614
- KCD15638

### Ordering Key

Type CDFL1A

#### Sensor

Without sensor <sup>1)</sup>	0
With sensor	1

#### Heat Exchanger

Without HE	0
With external HE	1

#### Hose Diameter

11,5*	1
7,3	2
9,3	3
14	4

#### Hose Length

2,5*	1
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#### Temperature Sensor

No*	0
1 channel PT100	1
2 channel PT100	2
1 channel K-Type	3
2 channel K-Type	4

#### Pressure Sensor (for WTx only)

No*	0
External connection (only with HE)	1

### Ordering Key

Type CDFL3A

#### Hose Diameter

11,5*	1
7,3	2
9,3	3
14	4

#### Hose Length

2,5*	1
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#### Temperature Sensor

No*	0
1 channel PT100	1
2 channel PT100	2
1 channel K-Type	3
2 channel K-Type	4

#### Pressure Sensor

No*	0
Internal connection	1
External connection	2

### Ordering Example\*

#### Type CDFL3A1100

DFL3x-5bar sensor, hoses 11,5 mm diameter, 2,5 m long, no temperature sensor, no pressure sensor

\* Standard configuration

<sup>1)</sup> = only with head exchanger (HE) WTx-5bar