

# Technical Datasheet



## VTD 03 (Ex)

Carrier-Frequency Pulse Amplifiers  
with Dual Pickup

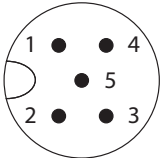
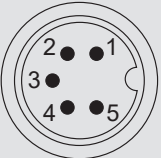
## Application

The VTD 03 are dual carrier frequency pickups for the ZHM gear flow meter series. Due to the wide frequency range (0.5 to 5000 Hz) they cover the whole flow range of all ZHM.

The VTD 03 provide either 2 frequency signals with 90° phase shift for true forward-backward detection, or the double frequency and a direction signal. The desired output signals can be easily selected via 2 sliding switches.

For applications in hazardous areas intrinsically safe versions with ATEX and IECEx certification for zone 1 and cCSAus certification for zone 0 and division 1 are available.

## Technical Data

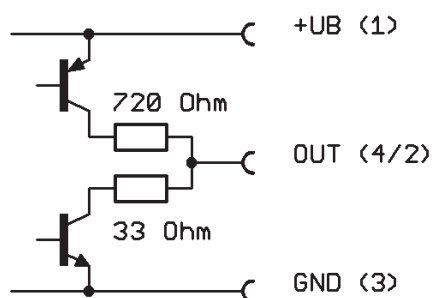
Supply Voltage $U_B$	10 up to 30 V DC, regulated 7 up to 30 V DC („U“, NAMUR operation) 5 up to 10.5 V („N“)	
Quiescent Current	< 2 mA	
Frequency Range	0.5 up to 5,000 Hz	
Ambient Temperature	-40 °C up to +80 °C [-40 °F up to +176 °F] (non Ex) -40 °C up to +60 °C [-40 °F up to +140 °F] (Ex, T4, ATEX, IECEx) -40 °C up to +50 °C [-40 °F up to +122 °F] (Ex, T4, CSA)	
Medium Temperature	-40 °C up to +80 °C [-40 °F up to +176 °F] (non Ex) -40 °C up to +60 °C [-40 °F up to +140 °F] (Ex T4)	
Housing	Aluminium	
Dimensions (w/o Connector)	l = 50 mm; w = 45 mm; h = 30 mm	
Ingress Protection	IP65	
Ex Protection	ATEX: II 2G Ex ia IIC T4 Gb IECEx: Ex ia IIC T4 Gb cCSAus: Class I, Div. 1, Groups A, B, C, D ; T4 Ex ia IIC T4 Ga Class I, Zone 0 AEx ia IIC T4 Ga ATEX: II 3G Ex nA IIC T4 Gc	
Electrical Connection <sup>1)</sup>	M12 plug-in connector (5-pin, male, A-coded) 1 = $+U_B$ 2 = $f_B / \text{DIR}$ 3 = 0 V 4 = $f_A / 2 \times f$ 5 = n.c.	
	M16 plug-in connector (5-pin, male, A-coded) (option) 1 = $+U_B$ 2 = $f_B / \text{DIR}$ 3 = 0 V 4 = $f_A / 2 \times f$ 5 = n.c.	

<sup>1)</sup> Other plugs or pin assignments on request.

## Ex-Supply Data

Supply Circuit (pin 1 and 3)	Voltage Current Power Capacity Effective internal capacitance	$U_i = \text{DC } 30 \text{ V}$ $I_i = 120 \text{ mA}$ $P_i = 850 \text{ mW}$ $L_i = 10 \mu\text{H}$ $C_i = 8 \text{ nF}$
Signal Output Circuit Push/pull (pin 2 and 3 / pin 4 and 3)	Voltage Current Power Capacity Effective internal capacitance	$U_i = 30 \text{ V}$ $I_i = 24.6 \text{ mA}$ $P_i = 185 \text{ mW}$ $L_i = 10 \mu\text{H}$ $C_i = 8 \text{ nF}$

## Output (short-circuit proof)



The output drivers are asymmetrical push pull output stages with the protective resistors of 720  $\Omega$  and 33  $\Omega$  as shown.

The high and low output voltages can be calculated as:

$$V_{\text{high}} = V_{\text{supply}} - 1 \text{ V} - (720 \Omega * I_{\text{load}})$$

$$V_{\text{low}} = 0,5 \text{ V} + (33 \Omega * I_{\text{load}})$$

The VTD 03 can give out the 2 frequency signals  $f_A$  and  $f_B$  or the double frequency  $2 * f$  and a direction signal DIR.

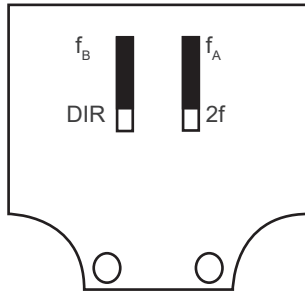
With a forward flow  $f_A$  is leading  $f_B$  by 90° and DIR is LOW.

### Changing the Setting

Switch off the power supply or disconnect the VTD 03 from the power supply.

Unscrew the 2 screws in the top cover and remove the top cover.

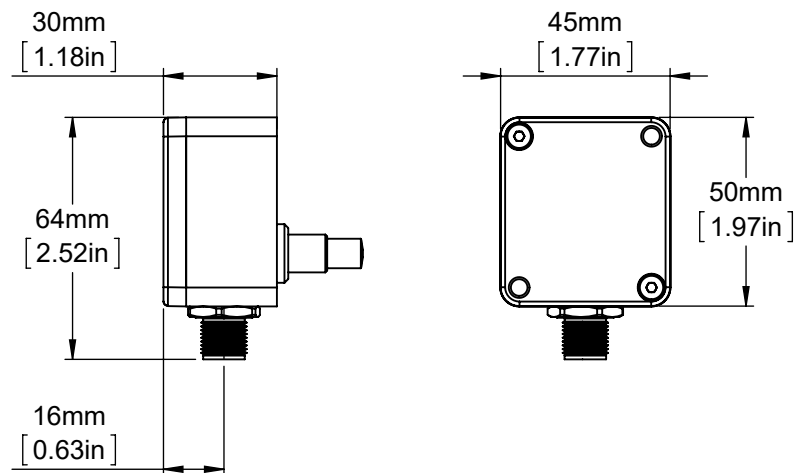
Set the 2 sliding switches in the desired position.



Default setting:  $f_A$ ,  $f_B$

Reclose the top cover and reconnect the power supply.

### Dimensional Drawing



## Ordering Information

	VTD03	-	X	-	X	-	X
<b>Flow Meter Type<sup>2)</sup></b>							
ZHM 01			10				
ZHM 01/1, 01/2			11				
ZHM 01/3			13				
ZHM 02, ZHM 02/1 and ZHM 03			20				
ZHM 04			40				
ZHM 05			50				
ZHM 01/1 or ZHM 01/2 (Cartridge)			81				
<b>Output Mode + Connector<sup>2)</sup></b>							
Connector M16, Push Pull (IEC60946)						A	
Connector M12, 5-pin A-coded Push Pull (IEC60946)						P	
<b>Ex Protection</b>							
No protection							
ATEX zone 2	II 3G Ex nA IIC T4 Gc						Exn
Ex-approved	ATEX: II 2G Ex ia IIC T4 Gb						Ex
	IECEX: Ex ia IIC T4 Gb						
	CSA: Class I, Div. 1, Groups A,B,C,D, T4						
	Ex ia IIC T4 Ga						
	Class I, Zone 0 AEx ia IIC T4 Ga						

## Safety Instructions

The following has to be adhered to:

- Installation instructions for electrical devices.  
Installation instructions for associated intrinsically-safe devices.  
The »Special conditions for safe use« as per EC-Type Examination Certificate.
- The amplifier has to be installed in a way that the max. ambient temperature does under no circumstances exceed +60 °C [+140 °F].
- With cables care should be taken, that the max inductivity and capacity of the respective voltage or gas group are not exceeded.
- Input frequencies outside the specified range (see technical data) will cause invalid frequency output signals.
- Shielded cables are to be used as connecting lines.
- Generally, supplied units have to be connected by an expert according to EMC stipulations.
- Disconnect power supply before soldering the electrical connector.

<sup>2)</sup> Other plugs or pin assignments on request.



Küppers Elektromechanik GmbH

[www.kem-kueppers.com](http://www.kem-kueppers.com)

[info@kem-kueppers.com](mailto:info@kem-kueppers.com)

### KEM Headquarters

Liebigstraße 5  
85757 Karlsfeld  
Germany

T. +49 8131 59391-0  
F. +49 8131 92604

[info@kem-kueppers.com](mailto:info@kem-kueppers.com)

### KEM Manufacturing Center

Wetzeller Straße 22  
93444 Bad Kötzing  
Germany

T. +49 9941 9423-0  
F. +49 9941 9423-23

[production@kem-kueppers.com](mailto:production@kem-kueppers.com)

### KEM Sales

Liebigstraße 5  
85757 Karlsfeld  
Germany

T. +49 8131 59391-100  
F. +49 8131 92604

[sales@kem-kueppers.com](mailto:sales@kem-kueppers.com)

### KEM Service & Repairs

Wetzeller Straße 22  
93444 Bad Kötzing  
Germany

T. +49 9941 9423-37  
F. +49 9941 9423-24

[service@kem-kueppers.com](mailto:service@kem-kueppers.com)

*More distributors & partners can be found at:  
[www.kem-kueppers.com](http://www.kem-kueppers.com)*