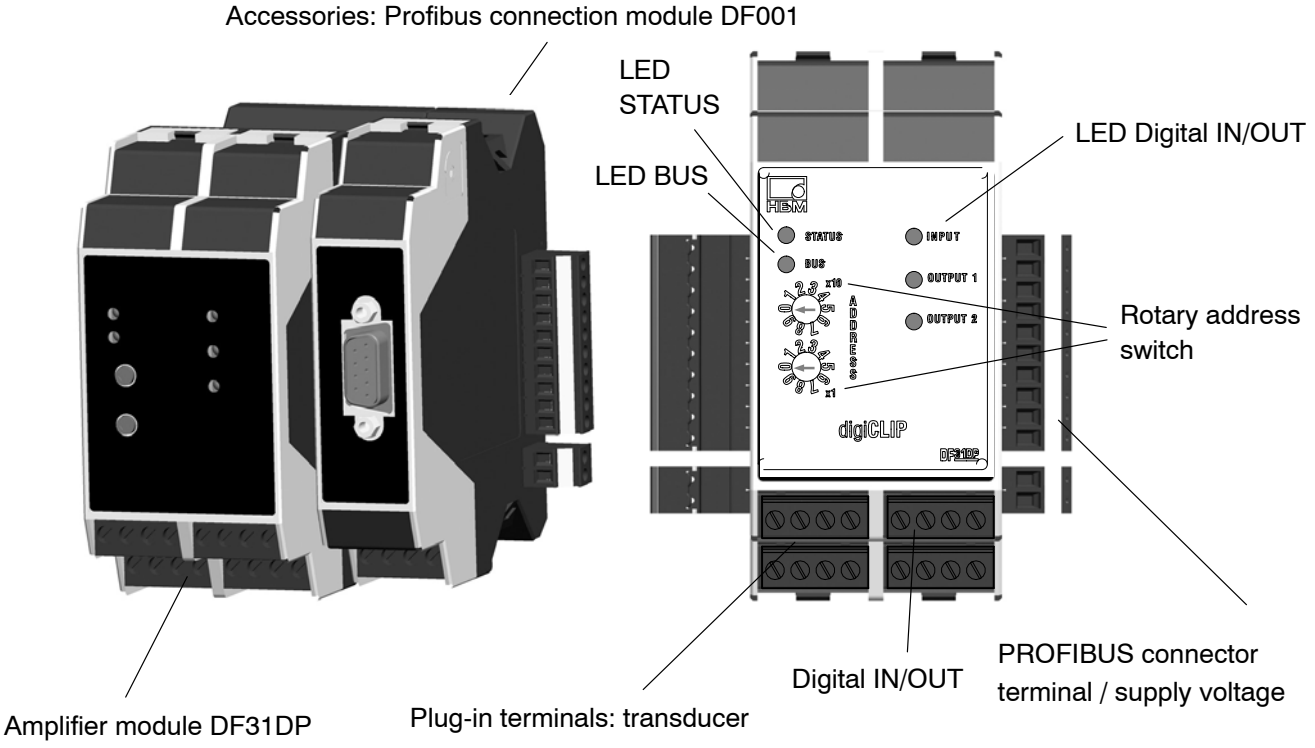
Data sheet

digiCLIP

DF31DP

Special features

- **Digital amplifier for industrial automation tasks and production process monitoring**
- **600 Hz CF measurement technology with TEDS sensor detection for SG full bridges**
- **Fast peak and limit value monitoring and digital inputs/outputs**
- **Accuracy class, typically 0.05%**
- **Modular mounting on a DIN EN 60715 type DIN rail (IEC 60715)**
- **Standardized Profibus DP interface with DPV1 functionality for parameterization and backup**



Technical data

digiCLIP			
Accuracy class (at U_B = 2.5 V and U_B = 1 V); after autocalibration		0.05 type. 0.1 in an industrial environment as per EN 61326 0.2 in the 10 mV/V measuring range	
Power supply			
Supply voltage, Overvoltage and reverse polarity protection	V_{DC}	24	
Isolation voltage, without transients Potential separation between the supply bus and transducer connection, functional separation, must not be considered for safety aspects	V_{DC}	< 60	
Permissible supply voltage range	V	18 ... 30	
Influence of supply voltage on accuracy	%/V	< 0.001	
Power consumption, max.; incl. transducer	W	3	
Amplifier			
Carrier frequency rectangle	Hz	600 (591.9 Hz ±100 ppm)	
Synchronization		when several interconnected modules are used, the carrier frequency is synchronized automatically	
Bridge excitation voltage UB, Peak–to–peak (±10%)	V	2,5	1,0
Measuring range	mV/V	±4	±10
Connectable transducers SG full bridge	ohms	80 ... 5000	
Connection technique		4 or 6–wire circuitry with single-wire open-circuit monitoring	
Permissible cable length between transducer and amplifier, max.	m	100	
Input resistance	MOhm	>5	
Measurement frequency range, adjustable (–3dB) (see filter table)	Hz	0.05 ... 225	
Filter characteristics		Bessel, 4th order	
Noise voltage relative to input, for UB = 2.5 V, typical	µV/V	1.0 (at filter frequenzy 100 Hz) 0.05 (at filter frequenzy 1 Hz)	
Influence of ambient temperature for change of 10 K on the zero point (TK0) on sensitivity (TKC)	 µV/V %	 0.1 0.05 f.s.	
Linearity deviation	% f.s.	0.005	
Long-term drift, without AutoCal	%	<0.001 (within 48 h)	
Communication interface			
Number of devices on the bus, max. Address settings Protocol Bit rate, max. Line length, max. Profibus ID number Parameterization (asynchronous) Profibus connection	 MBit/s m 	max. 97, in groups of max. 4, coupled via repeater 3 – 99 (adjustable via frontal rotary switch) Profibus DP slave, to DIN 19245–2, DPV1 Class 1 and Class 2; available at www.profibus.org 1,5 0,5 0,187 0,093 200 400 1000 1200 096D (hex) to Profibus DPV1 standard Side connector terminal; electrically isolated from supply and measurement ground Option: DF001: 9–pin Sub-D (DIN19245)	
Signal conditioning			
A/D converter		Delta-Sigma, 24–bit	
Scaling accuracy	bits	32	
Sampling rate	1/s	1184	

Input of characteristic curve		TEDS, calibration, editing
Zero balance		over the entire measuring range
Tare balance		over the entire measuring range
Duration of balance	ms	< 2
AutoCal	ms	< 300
Parameter memory		1 set (plus factory setting); saved in the EEPROM
Limit value switches		
Number		4
Functions		Switching threshold, hysteresis (2-point control), greater than, less than
Signal source (user-selectable)		gross, net, max, min, peak–to–peak
Hysteresis		adjustable over the entire measuring range
Update		at each measured value
Peak–value memory		
Number		3
Function		min., max., peak–to–peak
Update		at each measured value
Clearing peak–value memory	ms	< 2
Retaining the current measured value/peak value	ms	< 2
Current-value memory		Run /Hold
Digital input		
Number		1
Switching actions, any combination selectable		Flank controlled: Zeroing, taring, peak–value memory (min/max) one-off clear
		Level controlled: Peak–value memory (min/max) stop, continuous clear
Response time		Control action occurs at the latest with the next but one measurement value
Active input level can also be selected inverted	V	0 or 24
		(State of input level displayed by LED)
Input voltage range	V	0...30
Switching voltages		
Logic High level	V	>10
Logic Low level	V	<5
one-way fitting	V	–30 ... 0
Electrical isolation to supply, transducer and bus potentials		
Isolation voltage, functional, typ.	V	500
Input current at 24V, typ.	mA	12
Latency times of electronic digital input		
when changing from 0V to 24V, typ.	µs	200
when changing from 24V to 0V, typ.	µs	400
Permissible cable length to digital input, max.	m	30
Digital output		
Number		2
Switching actions, any combination can be selected separately for each output		Limit value switch 1 to 4, positive/negative range overrun, overload, measured value invalid
Response times		Switching action occurs with next measurement value, see ”Sampling rate”; exception: ”Measurement value invalid” after 300... 700 ms, typ.
Active input level can also be selected inverted separately for each output	V	0 or 24
		(State of output switch displayed by LED)
Output voltage (like supply voltage), nom.	V	24
Voltage drop with load, max.	V	2
Output currentat operating temperature	A	0.5. guaranteed per output
Short-circuit current, typ.	A	1.1

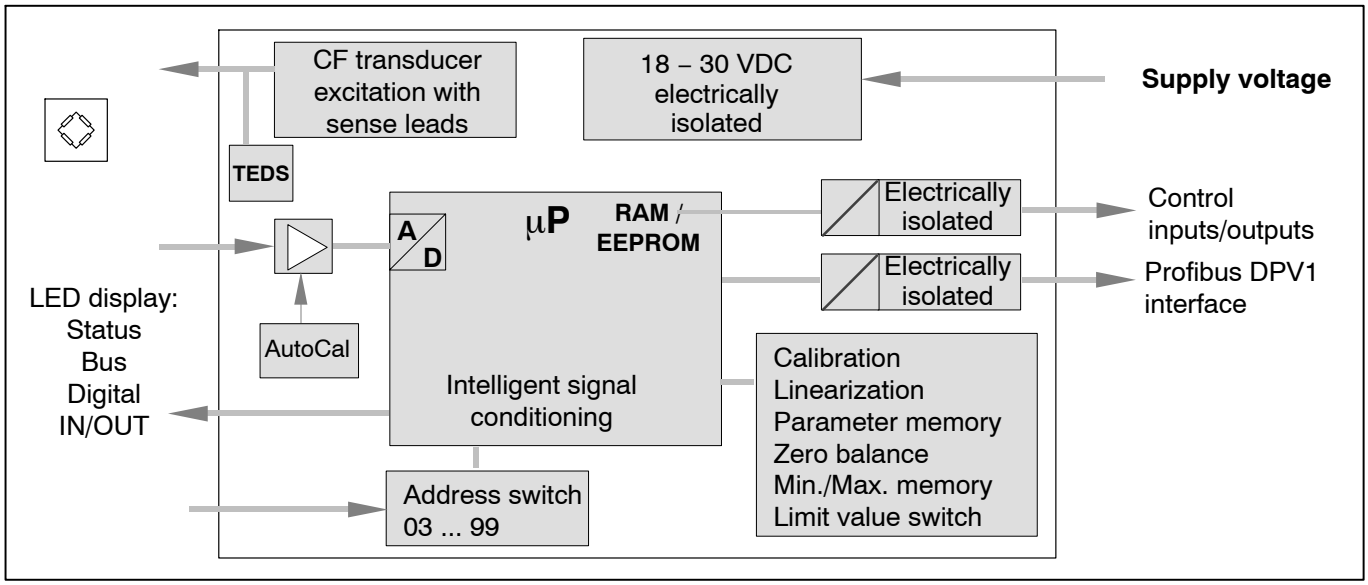
Short-circuit period		unlimited
Electrical isolation to transducer and bus potentials		
Isolation voltage, functional, typ.	V	500
Reference potential like supply voltage		
Latency times of electronic digital outputs		
when changing from 0V to 24V, typ.	µs	240
when changing from 24V to 0V, typ.	µs	400
Permissible cable length to digital input, max.	m	30
Environmental conditions		
Nominal temperature range	°C	0 ... +50
Operating temperature range	°C	–10 ... +60
Storage temperature range	°C	–20 ... +70
Permissible rel. humidity, non-condensing	%	10 ... 90
Enclosure		
Material		Polyamide PA 6.6
Dimensions (WxHxD) without connections	mm	23 x 100 x 114
Weight, approx.	g	150
Assembly		Support rail, DIN EN60715 (IEC 60715)
Connection		Plug-in terminals
Degree of protection		IP20
Reliability		
MTTF (MIL–HDBK–217F, Feb. 1995)	hours	92800
EMC conformance		
as per EN 61326*)		in an industrial environment

* For measurement as per EN 61326, May 2004 edition, Annex F, burst to shielding of the transducer or bus line, there must be compliance with the class accuracy of 0.1 when using filter frequencies up to and including 2 Hz. When a filter frequency of 100 Hz is used, the measurement variation can be as much as 1.3%.

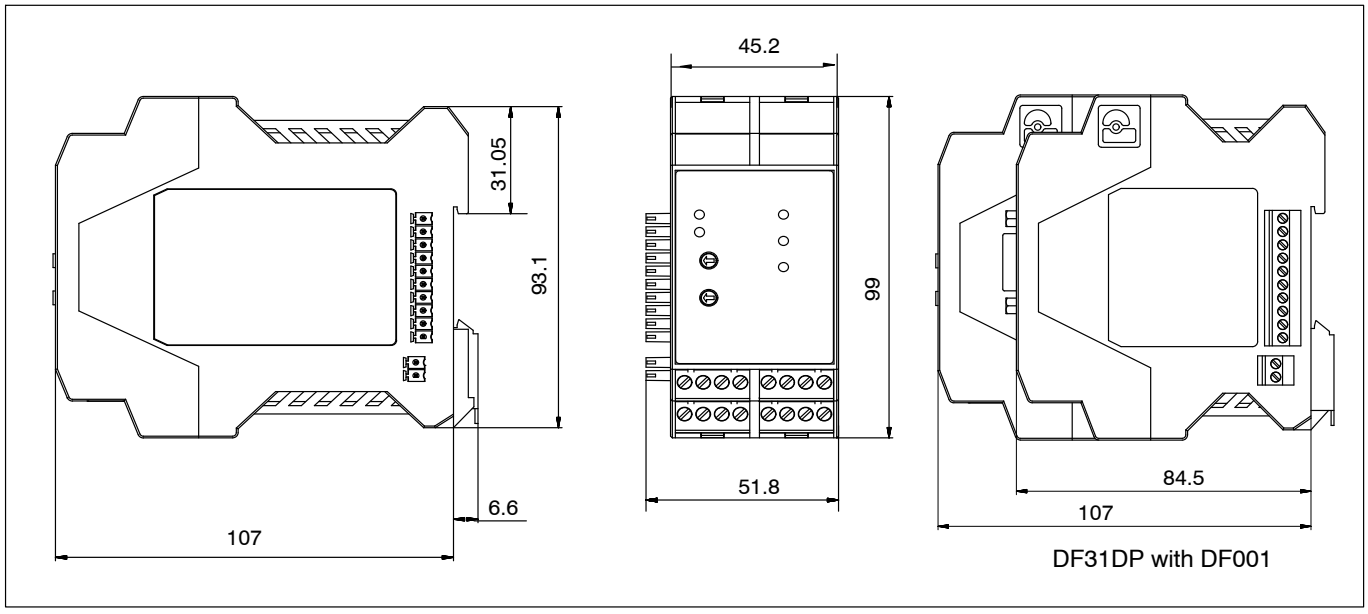
Filter data and sampling rate

Desired frequency	–1 dB (Hz)	–3 dB (Hz)	–20 dB (Hz)	Phase delay (ms)	Sampling rate (s^{-1})
100 Hz	130	225	560	2.3	1184
50 Hz	48	82	220	4.6	1184
20 Hz	20	34	100	9.5	1184
10 Hz	10.5	18.6	56	16.6	1184
5 Hz	5.2	9.3	28	31	592
2 Hz	2.1	3.7	11.2	70	237
1 Hz	1.05	1.8	5.6	140	118
0.5 Hz	0.52	0.9	2.8	280	59
0.2 Hz	0.21	0.36	1.1	700	24
0.1 Hz	0.105	0.18	0.56	1400	12
0.05 Hz	0.052	0.09	0.28	2800	6

Block diagram



Dimensions in mm



Scope of supply:

Module digiCLIP DF31DP		Order No.: 1–DF31DP
Coded plug connector for sensor connection (2 pieces)		Order No.: 3–3312.0404
Coded plug connector for digital IN/OUT (2 pieces)	24 V / 0 V	Order No.: 3–3312.0418
	IN / OUT	Order No.: 3–3312.0444
Plug-in terminal for PROFIBUS and supply voltage		Combicon Order No.: CR–MSTB

CD–ROM with free setup software (digiCLIP Assistant);
(the latest Assistant can be downloaded free of charge under http://www.hbm.com/support)

Accessories (not included among the items supplied):

Connector set for digiCLIP module (needed for two-tier installation in the control cabinet)	Order No.: 1–digiCLIP–ST
Connection module for frontal assignment of the rear terminal strip (bus and voltage supply)	Order No.: 1–DF001

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