UFM-70 FS

Multi-functional ultrasonic flowmetering system

The UFM-70 FS is a unique ultrasonic flow metering system with its focus on flexibility and performance. The practical modular design and wide variety of transmitter and transducer options available make it suitable for all applications. From simple water flow measurements to energy flow monitoring, automated process control and installation in safety-critical environments.

UFM-70 FS in watertight case

Features

- Sturdy IP67 transmitter with one or two measurement channels, graphic LCD display, internal data logger and input/output options
- For commonly used pipe materials and diameters from 10 to 6500 mm
- Intuitive menu, Setup Wizard and Audible Sensor Positioning Assistant™ for easy and quick setup and installation
- Transit-time correlation measurement using dual DSP technology for optimum measurement accuracy
- Heat Quantity Measurement capability and Ex approved instrument versions - *optional*
- 230 Volt plug - *standard*
- Battery pack for long term use - *optional*
- Remote measurement read out, GPRS based - *optional*
- Pressure Transmitter - *optional*

Introduction

The semi-portable UFM-70 FS is a multi-functional system for non-invasive and non-intrusive measurements, for both liquids and liquid gases. The incorporated KATflow 150 is an ultrasonic flowmeter which can be supplied with one or two measurement channels. This allows the flowmeter to simultaneously monitor up to two separate pipes. Alternatively, a dual-channel setup can be used for a multi-path mounting configuration of the sensors on one single pipe. The flowmeter is provided with an internal data logger and software for the recording and download of measured values. Thanks to its intuitive menu, Setup Wizard and Audible Sensor Positioning Assistant™, the flowmeter and sensors can be properly configured and installed within minutes.

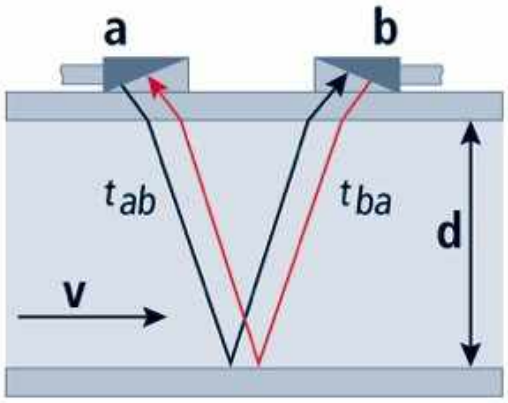
Additionally, the UFM-70 FS offers optional functions for measuring level, energy and pressure flows. This modular system is customizable, with different types of inputs and outputs and serial GPRS based communication (Netbiter). These features can be complemented by a pressure transmitter to measure flow and pressure simultaneously, an external battery pack for long term use, an internal datalogger and software for the recording and download of measured values. Optional transducer versions are available for ATEX-zones.

Incorporated KATflow 150

The technology behind the measurement

The UFM-70 FS non-invasive system works on the transit time ultrasonic principle. This involves sending and receiving ultrasonic pulses from a pair of sensors and examining the time difference in the signal.

U-F-M uses clamp-on transducers that are mounted externally on the surface of the pipe and which generate pulses that pass through the pipe wall.



Sensors a *and* b *work alternately to send and receive ultrasonic pulses. The sound waves* ab *travelling with the flow move faster than those travelling against it* ba.

The flowing liquid within causes time differences in the ultrasonic signals, which are then evaluated by the flowmeter to produce an accurate flow measurement. The key principle of the method applied is that sound waves travelling with the flow will move faster than those travelling against it.

The difference in the transit time of these signals is proportional to the flow velocity of the liquid and consequently the flow rate. Since elements such as flow profile, type of liquid and pipe material will have an effect on the measurement, the flowmeter compensates for and adapts to changes in the medium in order to provide reliable results.

The instruments can be used in a variety of locations and the flowmeters will operate on various pipe materials and diameters over a range of 50 mm to 1200 mm.

Technical specifications - Transmitter

Performance	
Measurement principle	Ultrasonic transit-time difference correlation
Flow velocity range	0.01 ... 25 m/s
Resolution	0.25 mm/s
Repeatability Accuracy	0.15 % of measured value, ±0.015 m/s
	Volume flow
	± 1 ... 3 % of measured value depending on application
	±0.5 % of measured value with process calibration
	Flow velocity (mean) ±0.5 % of measured value
Turn down ratio	1/100
Measurement rate	10 ... 1000 s^{-1}
Response time	1 s, 70 ms (optional)
Damping of displayed value	0 ... 99 s
Gaseous and solid content of liquid media	< 10 % of volume
General	
Enclosure type	Wall mounted
Degree of protection	IP 66 according to EN 60529
Operating temperature	-10 ... +60 °C (+14 ... +140 °F)
Housing material	Polycarbonate (UL94 V-0)
Measurement channels	1 or 2
Calculation functions	*Average, difference, sum, maximum* (dual-channel use only)
Power supply	100 ... 240 V AC, 50/60 Hz or 9 ... 36 V DC
	Special solutions (e.g. solar panel, battery) on request
Display	LCD graphic display, 128 x 64 dots, backlit
Dimensions	237 (h) x 258 (w) x 146 (d) mm
Weight	Approx. 2,3 kg
Power consumption	< 10 W
Operating languages	English, French, German, Dutch, Spanish, Italian, Russian,
	Czech, Turkish, Romanian (others on request)
Communication	
Type	RS 232, USB cable (optional), RS 485 (optional), Modbus RTU
	(optional), HART* compatible (optional), Profibus PA
Transmitted data	Measured and totalised value, parameter set and
	configuration, logged data
Internal data logger	
Storage capacity	Approx. 30,000 measurements (each comprising up to 10
	selectable measurement units), logger size 5 MB
	Approx. 100,000 measurements (each comprising up to 10
	selectable measurement units), logger size 16 MB
Logged data	All measured and totalised values, parameter sets

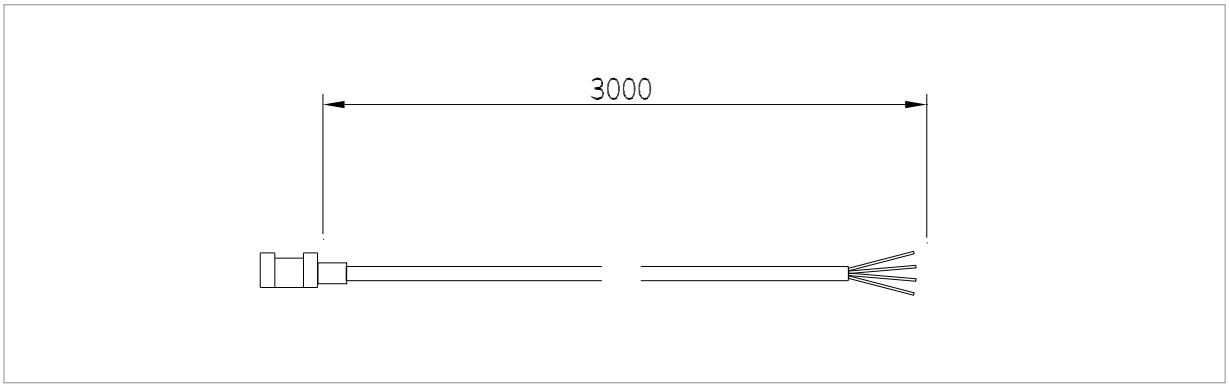
Technical specifications - Transmitter (continued)

KATdata + software	
Functionality	Download of measured values/parameter sets, graphical presentation, list format, export to third party software, online transfer of measured data
Operating systems	Windows 10, 8, 7, Vista, XP, NT, 2000 | Linux
Quantity and Units of measurement	
Volumetric flow rate	m3/h, m3/min, m3/s, l/h, l/min, l/s USgal/h (US gallons per hour), USgal/min, USgal/s bbl/d (barrels per day), bbl/h, bbl/min
Flow velocity	m/s, ft/s, inch/s
Mass flow rate	g/s, t/h, kg/h, kg/min
Volume	m3, l, gal (US gallons), bbl
Mass	g, kg, t
Heat flow	W, kW, MW (with heat quantity measurement option)
Heat quantity	J, kJ, kW/h (with heat quantity measurement option)
Temperature	°C (with heat quantity measurement option)
Process inputs (galvanically isolated)	
Temperature	PT100 (clamp-on sensors), three- or four-wire circuit, measurement range: -30 ... +250 °C (-22 ... +482 °F), resolution: 0.1 K, accuracy: ±0.2 K
Current	0/4 ... 20 mA active or 0/4 ... 20 mA passive, U = 30 V, R_i = 50 Ω, accuracy 0.1 % of measured value
Process outputs (galvanically isolated)	
Current	0/4 ... 20 mA active/passive (R_{LOAD} < 500 Ω), 16 bit resolution, U = 30 V, accuracy: 0.1 %
Digital open collector	Value 0.01 ... 1000/unit, width 1 ... 990 ms, U = 24 V, I_{MAX} = 4 mA
Digital relay	2 x Form A SPST (NO and NC), U = 48 V, I_{MAX} = 250 mA
Voltage	0 ... 10 V, R_{LOAD} = 1000 Ω
Frequency	2 Hz ... 10 kHz, 24 V/4 mA
HART compatible	0/4 ... 20 mA, 24 V DC, R_{GND} = 220 Ω

UFM-70 FS with clamped-on transducers

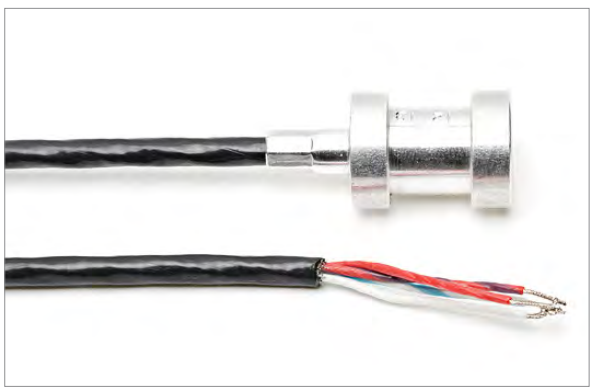
Technical specifications - PT100 clamp-on sensors (for Heat Quantity Measurement function)

General	
Type	PT100 (clamp-on sensors)
Measurement range	-30 ... +250 °C (-22 ... +482 °F)
Circuits	4-wire
Accuracy T	±(0.15 °C + 2 x 10-3 x T [°C]), class A
Accuracy ▲T	U 0.1 K (3 K < ▲T < 6 K), corresponding to EN 1434-1
Response time	50 s
Dimensions sensor heads	20 (h) x 15 (w) x 15 (d) mm
Material sensor heads	Aluminium
Material cable jacket	PTFE
Cable length	3.0 m



PT100 transducer

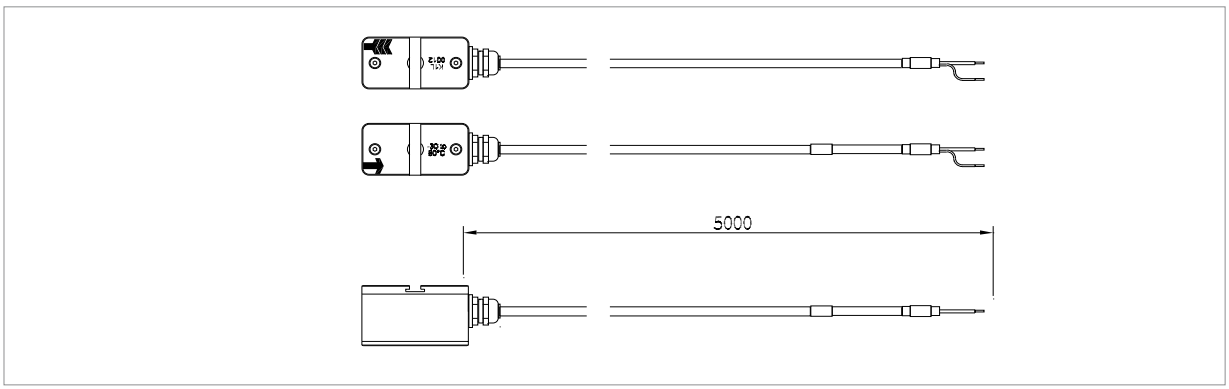
PT100 transducer fixed to pipe



PT100 with wired cable connection

Technical specifications - Transducers K1L, K1N, K1E

K1L, K1N, K1E	
Pipe diameter range	Type K1N/E : 50 ... 3,000 mm
	Type K1L : 50 ... 6,500 mm
Dimensions sensor heads	60 (h) x 30 (w) x 34 (d) mm
Material sensor heads	Stainless steel
Material cable conduits	Type K1L : PVC
	Type K1N/E : Stainless steel
Temperature range	Type K1L : -30 ... +80 °C (-22 ... +176 °F)
	Type K1N : -30 ... +130 °C (-22 ... +266 °F)
	Type K1E : -30 ... +250 °C (-22 ... +482 °F)
	(for short periods up to +300 °C (+572 °F))
Degree of protection	IP 66 according to EN 60529 (IP 67 and IP 68 on request)
Standard cable lengths	Type K1L : 5.0 m
	Type K1N/E : 4.0 m



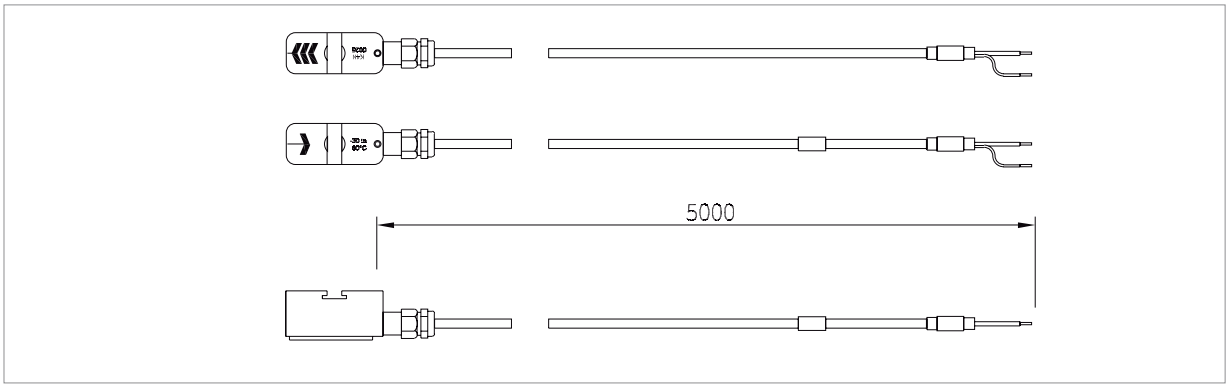
K1L transducer

K1L transducers

K1N/E transducers

Technical specifications - Transducers K4L, K4N, K4E

K4L, K4N, K4E	
Pipe diameter range	Type K4N/E : 10 ... 250 mm
	Type K4L : 10 ... 250 mm
Dimensions sensor heads	43 (h) x 18 (w) x 22 (d) mm
Material sensor heads	Stainless steel
Material cable conduits	Type K4L : PVC
	Type K4N/E : Stainless steel
Temperature range	Type K4L : -30 ... +80 °C (-22 ... +176 °F)
	Type K4N : -30 ... +130 °C (-22 ... +266 °F)
	Type K4E : -30 ... +250 °C (-22 ... +482 °F)
	(for short periods up to +300 °C (+572 °F))
Degree of protection	IP 66 according to EN 60529 (IP 67 and IP 68 on request)
Standard cable lengths	Type K4L : 5.0 m
	Type K4N/E : 2.5 m



K4N/E transducers

K4L transducers

K4N/E transducers

Technical specifications - Transducers for Hazardous Areas

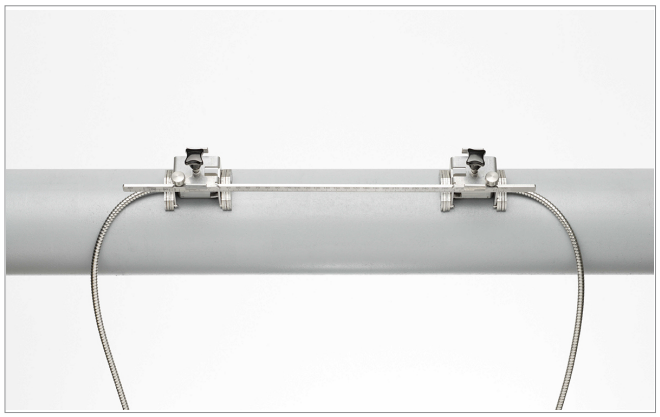
K1Ex, K4Ex	
Pipe diameter range	Type K4Ex : 10 ... 250 mm
	Type K1Ex : 50 ... 3,000 mm
Dimensions sensor heads	60 (h) x 30 (w) x 34 (d) mm
Material sensor heads	Stainless steel
Material cable conduits	PFTE
Temperature range	-50 ... +115 °C (-58 ... +239 °F)
Standard cable length	5,0 m
Degree of protection	IP 68 according to EN 60529
Ex-certification code	II 2G Ex mb IIC T4 - T6 X
	II 2D Ex mbD 21 IP68 T80 °C - T120 °C X
Ex-certification number	TRAC 09 ATEX 21226 X
Ex-protection method	Encapsulation (m), ignition source control (b)
Note :	*The transducers are approved for use in hazardous areas classified as Ex-Zone 1 and 2. They are connected to the flowmeter via extension cables and Ex-approved junction boxes. The flowmeter can be installed in a safe area or, if equipped with the additional Ex-enclosure, together with the transducers in a hazardous environment.*

Technical specifications - Transducer Extension Cable

Extension cable	
Available lengths	5.0 ... 100 m
Cable type	Coaxial
Material cable jacket	TPE
Operating temperature	-40 ... +80 °C (-40 ... +176 °F)
Minimum bend radius	67 mm
Cable connection	
Connection types	Junction box, Amphenol connectors (for transducer type N)
Terminaton into transmitter	SMB connector (SubMiniature version B)
	Direct cable connection (terminal block)

Technical specifications - Transducer Mounting Accessoiries

Mounting accessories	
Diameter range and mounting types	Clamping set (metal strap with screw),
	stainless steel: DN 10 ... DN 40
	Metallic straps and clamps: DN 15 ... DN 310
	Metallic straps and clamps: DN 25 ... DN 3,000
	Metallic mounting rail and straps (available on request):
	DN 50 ... DN 250 or DN 50 ... DN 3,000
Magnetic mounting rail	Mounting bracket for serial measurements on steel pipes,
	magnetic steel, 330 mm (available on request)



Example of magnetic mounting rail

Metallic mounting rail with straps and transducers

Configuration code : Transmitter and accessories

KF 150	Ultrasonic flowmeter KATflow 150, serial interface RS 232, operating instructions											
	Number of measurement channels											
	1	1 measurement channel										
	2	2 measurement channels[1]										
		Internal code										
		03	Internal code									
			Power supply									
			1	100 … 240 V AC, 50/60 Hz								
			2	9 … 36 V DC								
			Z	Special (please specify)								
				Enclosure type								
				1	Polycarbonate (UL94 V-0), wall mounted, IP 66							
				2	Hazardous area enclosure, powder-coated LM6 cast alloy, IP 66 (II 2G/D Ex d IIB T4 - T6 IP67)							
				Z	Special (please specify)							
					Communication							
					0	Without						
					1	RS 485 serial interface						
					2	Modbus RTU protocol[2]						
					Z	Special (please specify)						
						Process inputs/outputs (select a maximum of 8 slots)						
						N	Without					
						C	Current output, 0/4 ... 20 mA, active (source)					
						P	Current output, 0/4 ... 20 mA, passive (sink)					
						D	Digital output, open-collector					
						R	Digital output, relay					
						H	HART* compatible output, 0/4 ... 20 mA[2]					
						V	Voltage output, 0 ... 10 V					
						F	Frequency output, 2 Hz ... 10 kHz					
						A	1 x PT100 input for temperature compensation (select TC function)[3]					
						AA	2 x PT100 input for 1-channel heat quantity measurement (select HQM option no. 2)[4]					
						AAAA	2 x PT100 input for 2-channel heat quantity measurement (select HQM option no. 3)[4]					
						B	Current input , 0/4 ... 20 mA, active or passive					
						Z	Special (please specify)					
							Internal data logger					
							0	Without				
							1	30,000 measurements				
							2	100,000 measurements				
							Z	Special (please specify)				
								Temperature compensation (TC)/Heat quantity measurement (HQM)				
								0	Without			
								1	With TC incl. 1 x PT100 sensor, 3 m cable[3]			
								2	With 1-channel HQM incl. 2 x PT100 sensor, 3 m cable[4]			
								3	With 2-channel HQM incl. 4 x PT100 sensor, 3 m cable[4]			
								Z	Special (please consult factory)			
									Sound velocity output (SVO)[5]			
									0	Without		
									1	With SVO		
										PT100 cable extension		
										0	Without	
										PTJ	With 1 x junction box for PT100 sensor	
										2PTJ	With 2 x junction box for PT100 sensors	
										3PTJ	With 3 x junction box for PT100 sensors	
										4PTJ	With 4 x junction box for PT100 sensors	
											PT100 extension cable (length in m)	
											000	Without
											___	With extension cable (specify length in m)
												Optional items
												Without (leave space blank)
												Ex Suitable for connection with Ex-transducers
												SW KATdata+ download software and RS 232 cable
												SU KATdata+ download software and USB cable

KF 100 - 2 - 03 - 1 - 1 - 0 - CDR - 0 - 0 - 0 - 0 - 000 / (example configuration)

The configuration is customised by choosing from the above-listed options and is expressed by the resulting code at the bottom of the table.

1) For simultaneous measurement on two separate pipes or for measurement on one single pipe in a two-path sensor mounting configuration.
2) Modbus and HART* compatible outputs can not be used in conjunction with other output options. Please consult factory for more information.
3) For temperature compensation in cases of significant changes in medium temperature during measurement.
4) For contactless measurement of thermal energy consumption (for one circuit or two circuits).
5) For contactless product recognition and interface detection.

Configuration code : Transducers and accessories

K1	Transducer pair, pipe diameter range 50 ... 3,000 mm									
K4	Transducer pair, pipe diameter range 10 ... 250 mm									
Z	Special (please consult factory)									
	Temperature range									
	L	Process temperature -30 ... +80 °C, including acoustic coupling paste								
	N	Process temperature -30 ... +130 °C, including acoustic coupling paste								
	E	Process temperature -30 ... +250 °C, including acoustic coupling paste								
	Ex	Process temperature -50 ... +115 °C, including acoustic coupling paste (II 2G Ex mb IIC T4 - T6 X)								
	Z	Special (please consult factory)								
		Internal code								
		1	Internal code							
			Degree of protection							
			1	IP 66 (standard)						
			2	IP 67 (please consult factory)						
			3	IP 68 (please consult factory)						
			Z	Special (please specify)						
				Transducer mounting accessories						
				0	Without					
				3	Clamping set DN 10 ... 40					
				4	Metallic straps and clamps DN 15 ... 310					
				5	Metallic straps and clamps DN 25 ... 3,000					
				7	Metallic mounting rail and straps DN 50 ... 250 (transducer type K4)					
				8	Metallic mounting rail and straps DN 50 ... 3,000 (transducer type K1)					
				Z	Special (please specify)					
					Stainless steel tag					
					0	Without				
					1	With stainless steel tag (please specify text to be engraved)				
						Transducer connection type and extension cable length				
						O	Without connector or junction box (transducer type L or Ex)			
							C 000	Wired transducer connection to flowmeter		
						D	Without connector or junction box (transducer type N)			
							C 000	Direct transducer connection to flowmeter		
						A	Extension via Amphenol type connector (transducer type N)			
							C 010	With extension cable, 10 m length		
							C___	With extension cable (specify length in m)		
						J	Extension via junction box (transducer type L or N)			
							C 005	With extension cable, 5 m length		
							C 010	With extension cable, 10 m length		
							C___	With extension cable (specify length in m)		
						JX	Extension via ATEX-junction box (transducer type Ex)			
							C 005	With extension cable, 5 m length		
							C 010	With extension cable, 10 m length		
							C___	With extension cable (specify length in m)		
						Z	Special (please specify)			
								Optional items		
									Without (leave space blank)	
								CA	5-point calibration with certificate	

K1 L - 1 - 1 - 5 - 0 - J - C 010 / (example configuration)

The configuration is customised by choosing from the above-listed options and is expressed by the resulting code at the bottom of the table.

Optional : Battery Pack

LiFePO4

Our LiFePO4 (Lithium Iron Phosphate) battery has a built-in SMART BMS offering features like cell balancing, temperature protection, over-discharge protection, deep-discharge protection, short circuit protection and Bluetooth® monitoring. The LiFePO4 battery has an extreme lifespan of >3000 cycles at 1C (100% DOD) and >6000 cycles at 0,2C (100% DOD) and the option to connect 4 batteries in series, or 4 batteries in parallel.

Features

- Up to 10 times more cycles than comparable lead acid batteries
- Double, triple or quadruple capacity / voltage through parallel or serial pairing
- Low self-discharge and quick and efficient charging
- Bluetooth® APP to monitor all relevant data
- Only 1/3 of the weight of a comparable lead acid battery

Technical specifications

LiFePO4 Battery Pack	
Nominal voltage	12,8V (4S)
Rated capacity (CC 0.2C to 10 V)	20 Ah
Nominal energy	256 Wh
Internal resistance	≤ 60 mΩ
Terminal type	M6
Cycle Life (@DOD 100% at 1C and ±25°C)	> 3000
Cycle Life (@DOD 100% at 0.2C and ±25°C)	> 6000
Connection options	4 in series / 4 in parallel
Communication	Bluetooth®
Length	181 ±3 mm
Width	76 ±3 mm
Height	166 ±3 mm
Weight	approx. 3.0 Kg
Housing material	ABS

Optional : Remote Measurement Read Out

Netbiter™

Wherever your field equipment is located, just simply connect it to an EasyConnect gateway and you will be able to access equipment data directly through the Netbiter Argos data center. The plug-and play feature makes it possible to perform large scale installations quickly without being an IT/Mobile network expert.

Features

- No IT expertise required
- No firewall issues
- No VPN required
- No static IP needed
- No programming
- No hassles

Technical specifications

Netbiter	
Description	EC360 - metal housing
GSM/GPRS	Quad band GPRS Class 12 850/900/1800/1900 Mhz
Relay output	1 (max 24 V, AC/DC, 1A)
Digital inputs	2 (isolated, max 24 V DC)
Analog inputs	2 (PT100, 0-10 V or 0-20 mA)
Analog outputs	1 (0-10 V)
Serial port #1	RS-232 up to 115 kbit/s
Serial port #2	RS-485 up to 115 kbit/s (isolated)
Antenna connector	SMA female
Wall mounting / DIN-rail	YES / YES (optional)
Mechanical dimensions	92 x 115 x 25 mm
Operating temperature	-30 to +65°C
Power supply	9-24 V DC
Power consumption	2W
Certification	CE

Optional : Pressure Transmitter

ATM.ECO - Analog Pressure Transmitter

ATM.ECO analog pressure transmitters are suitable for all processes involving liquids and gases. The modular construction ensures a pressure sensor for each specific production process: all ranges, absolute or relative, extreme accuracy, high and low temperatures.

Features

- Pressure measuring range : 100 mbar ~ 1000 bar
- Accuracy : ≤ ± 0.2 % FS
- Operating temperature : -40 ~ +125°C
- Process temperature : -40 ~ +150°C
- Output signal : 0 ~ 5 / 0 ~ 10 VDC, 4 ~ 20 mA
- Total Error Band : ≤ ± 0.3 % FS (0 ~ 70°C)
- Process connection : G 1/4 F, 1/4 NPT, 1/2 NPT, G 1/4 M, G1/2 M
- Materials : Stainless steel

Technical specifications

Pressure measuring range (bar)

	0 ... 0.1 to 0 ... < 1	0 ... 1 to 0 ... ≤ 100	0 ... > 100 to 0 ... ≤ 600, (2)
Overpressure (Proof)	3 bar	3 x FS	3 x FS (≤ 850 / ≤ 1500 bar)
Burst pressure	> 200 bar	> 200 bar	> 850 / > 1500 bar
Accuracy, (3) (± % FS)	≤ 0.2	≤ 0.2	≤ 0.2
Total Error, (4), (± % FS ; typ. / max.)			
0 ... 70°C compensated	≤ 0.4 / 0.8	≤ 0.3 / 0.6	≤ 0.7 / 1.0
-25 ... 100°C compensated	≤ 0.6 / 1.0	≤ 0.4 / 0.8	≤ 1.0 / 1.2
-40 ... 100°C compensated	≤ 0.8 / 1.4	≤ 0.6 / 1.2	≤ 1.0 / 1.5
Response time, (typ.)	< 1ms / 10 ... 90 % FS	< 1ms / 10 ... 90 % FS	< 1ms / 10 ... 90 % FS
Long term stability, (typ./max. per year)	< 1 mbar / < 2 mbar	< 0.1 % FS / < 0.2 % FS	< 0.1 % FS / < 0.2 % FS

Technical specifications - ATM.ECO Pressure Transmitter (continued)

Pressure measuring range (bar)

	0 ... > 600 to 0 ... 1000	0.8 ... 1.2, (1)	-0.05...0.05 to -0.1...0.1
Overpressure (Proof)	≤ 850 / ≤ 1500 bar	3 x FS	3 bar
Burst pressure	> 850 / > 1500 bar	> 200 bar	> 200 bar
Accuracy, (3) (± % FS)	≤ 0.2	≤ 0.2	≤ 0.2
Total Error, (4), (± % FS ; typ. / max.)			
0 ... 70°C compensated	≤ 0.7 / 1.0	≤ 0.4 / 0.8	≤ 0.4 / 0.8
-25 ... 100°C compensated	≤ 1.0 / 1.2	≤ 0.6 / 1.0	≤ 0.6 / 1.0
-40 ... 100°C compensated	≤ 1.0 / 1.5	≤ 0.8 / 1.4	≤ 0.8 / 1.4
Response time, (typ.)	< 1ms / 10 ... 90 % FS	< 1ms / 10 ... 90 % FS	< 1ms / 10 ... 90 % FS
Long term stability, (typ./max. per year)	< 0.1 % FS / < 0.2 % FS	< 1 mbar / < 2 mbar	< 1 mbar / < 2 mbar

	>-0.1... >0.1 to -0.5...0.5	>-0.5... >0.5 to -1...100
Overpressure (Proof)	3 bar	3 bar / 3 x FS
Burst pressure	> 200 bar	> 200 bar
Accuracy, (3) (± % FS)	≤ 0.2	≤ 0.2
Total Error, (4), (± % FS ; typ. / max.)		
0 ... 70°C compensated	≤ 0.4 / 0.8	≤ 0.3 / 0.6
-25 ... 100°C compensated	≤ 0.6 / 1.0	≤ 0.4 / 0.8
-40 ... 100°C compensated	≤ 0.8 / 1.4	≤ 0.6 / 1.2
Response time, (typ.)	< 1ms / 10 ... 90 % FS	< 1ms / 10 ... 90 % FS
Long term stability, (typ./max. per year)	< 1 mbar / < 2 mbar	< 0.1 % FS / < 0.2 % FS

(1) Typical barometricpressure range, max. offset: 900 mbar, min. span: 400 mbar
(2) Overpressure (proof) and burst pressure 1500 bar (stainless steel) optional
(3) Zero based accuracy according to EN-61298, incl. hysteresis and repeatability at ambient temperature
(4) Total error including accuracy and temperature influences at maximum signal span (16 mA / 10 V DC)

Temperature range

Operating temperature	-40 ... 125°C
Process temperature	Standard: -40 ... 125°C; Optional: -40 ... 150°C (with cooling fins)
Storage temperature	-40 ... 125°C

Ultrasonic Flow Management