ETLFlow

Flow Meters

Turbine and Positive Displacement Flowmeters

ETL Flow are based in North Yorkshire, United Kingdom. We manufacture, design and supply a range of Turbine and Positive Displacement Flowmeters.

Our selection of turbines and positive displacement gear meters, offer a wide range of flow and range options.

Our flow meters offer a competitive priced product of high specifications into the market place for low to medium viscosity fluids, with a number of customisable options, including own branding.

We have many years of experience in a number of industries including oil, gas, steel, chemical, water and industrial markets. We pride ourselves in being able to offer bespoke systems, customised models to your requirements in very short lead times.

ETLFlow

Turbine Flow Meters

Turbine Flow Meters machined from one piece stainless steel, available in a wide range - 0.3 l/min up to 10,000 l/min, industrial and high accuracy versions with excellent turn down ratios.

Standard versions suitable for many low viscosity applications, and are suitable for water, solvents, light oil, antifreeze, water glycols.

Various electronic output versions including ATEX, pulse, 4-20ma, and can be supplied calibrated and connected to displays, loggers, batch controllers.

ETLFlow

High Accuracy Turbine Flow Meter with Female Thread
ETLFLOW-300F-GF BSPP (G Thread) Female Thread
ETLFLOW-300F-NF NPT Female Thread

- **High pressure resistance**
- **Low pressure loss**
- **Fast response time**
- **High repeatability and accuracy**
- **Resistant to contamination**
- **Pulse / analog output selectable**

Fluid flowing through ETLFLOW-300F causes the rotor to revolve. As the rotor blade pass the pickoffs, electrical pulses are produced in which frequency is proportional to the flow rate. The revolutions per minute and the K-factor (number of pulses/litre) make it possible to obtain the flow volume passing through the unit.

ETLFLOW-300F series are used to measure medium or lower viscosity media, such as water, light fuel, solvent, hydraulic oil, lubricating oil etc.

Nominal Diameter	DN4...DN40
Applicable Medium	Medium or lower viscosity liquids
Accuracy	Better than ±1% of reading，±0.5% /±0.2% selectable
Repeatability	±0.1% of reading
Pressure Rating	MAX. 420bar
Ambient Temperature	-40...85℃
Medium Temperature	-40...120℃，-200...400℃ (high temprature type)
Materials	
Body / Rotor Support	304 stainless steel (316 stainless steel optional)
Turbine	Stainless steel
Shaft	Tungsten carbide/ceramic
Bearing	Stainless steel ball bearing,
	Tungsten carbide/ceramic journal bearing
Process Connection	BSPP female thread, NPT female thread

Applications

- Petrochemical/energy industry
- Hydraulic/lubrication system
- Water treatment
- Oil / gas industry
- Test systems

Parameter Table

Types	Measuring Range (L/Min)		Max. Pressure Rating（bar)	DN (mm)	Process Connection BSPP/NPT	Filtration (micron)	
	Magnetic pickoff	Carrier frequency pickoff				Journal bearing	Ball bearing
ETLFLOW-300F/**GF(NF)...4.5L**	**0.6-4.5**	0.3—4.5	**420**	4	G1/4 or 1/4"NPT	75	-
ETLFLOW-300F /GF(NF)...10L	1.6-10	0.8—10	420	6	G1/4 or 1/4" NPT	75	-
ETLFLOW-300F /**GF(NF)...20L**	**3-20**	1.5—20	**420**	10	G3/8 or 3/8" NPT	100	30
ETLFLOW-300F/GF(NF)...100L	10-100	5—100	420	15	G1/2 or 1/2" NPT	150	50
ETLFLOW-300F/**GF(NF)...130L**	**13-130**	6—130	**420**	20	G3/4 or 3/4" NPT	150	50
ETLFLOW-300F/GF(NF)...170L	17-170	8—170	420	25	G1 or 1" NPT	150	70
ETLFLOW-300F/GF(NF)...250L	25-250	12—250	420	32	G1-1/4 or 1-1/4"NPT	200	100
ETLFLOW-300F/GF(NF)...320L	32-320	16—320	420	40	G1-1/2 or 1-1/2"NPT	200	100

Pickoffs & Amplifiers

ETLFLOW-300F can be integrated with several different pickoffs, preamplifiers and signal conditioners, such as magnetic pickoffs carrier frequency pickoffs, Linear correction preamplifiers, smart control units, to meet specific measurement needs.

Pickoffs

Magnetic pickoffs can sense a ferrous rotor and is ideal for use in all types of ETL Flow turbine flow meters. Options include cryogenic, high temperature and explosion proof.

Carrier frequency pickoffs offer low speed response, no drag, large sensing distance and can sense non-ferrous metals like aluminum or nonmagnetic stainless steel in addition to ferrous metal. Unlike magnetic pickoff, an Carrier frequency pickoff is not a passive device and requires coupling with a signal conditioners/preamplifier. These devices produce a square wave output versus the analog sine wave of the magnetic pickoff.

Amplifiers

ETL Flow has developed a line of preamplifiers and signal conditioners for installation with our pickoffs . Our offerings include preamplifiers in several different configurations.

Pulse output amplifier – Output with square signal, proportional to the flow rate.
Amplifier with Linearized pulse output – Extending the measuring range and with multi-point linearization, with square wave output, frequency proportional to the flow rate.
Amplifier with Analog output – Current analog output or voltage analog output, such as 0-10V, 0-5V, 0-20mA, 4- 20mA.
Amplifier with Linearized analog output – Extended measuring range and with multi-point linearization, analog output.
Intelligent flow computer – Digital display, analog output / communication RS485/ switch output optional.

Bearings

Bearings are available in three styles, stainless steel ball , tungsten carbide journal sleeve and ceramic journal sleeve. ceramic bearing eliminate adhesive wear and perform well in low or non-lubricating liquids found in cryogenic fluids and water. Ball bearings have the least amount of drag, thus provide the widest capable flow range. Journal bearings create more drag, therefore reducing the turndown capability of the flow meter.

Tungsten carbide journal bearing – Applicable to low or non-lubricating media, narrow turndown ratio of the flow meter relative with ball bearing.
Stainless steel ball bearing – Applicable to lubricating media, with low friction, lower limit for flow meter and wider turndown ratio.
Ceramic journal bearing – Self-lubricating, applicable to non-lubricating media such as liquid nitrogen, narrow turndown ratio of the flow meter relative with ball bearing

Electronics

ETLFLOW-300F series assembled with below pickoffs:

VS – Magnetic pickoffs with pulse output amplifier
RS – Carrier frequency pickoffs with pulse output amplifier

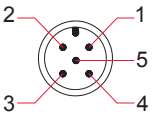
Power Supply	12…30VDC
Current Consumption	8mA
Outputs	NPN OC output; NPN OC output+pull-up resistor
Reverse Polarity Proof	Yes
Short-circuit Proof	Yes
Operating Temperature	-40…120℃
Ambient Temperature	-40…85℃
Electrical Connection	M12x1plug
	DIN43650-A plug (solenoid plug)
Protection Class	M12X1plug: IP67
	DIN43650-A plug: IP65

VH – High temperature magnetic pickoffs with pulse output amplifier
RH – High temperature carrier frequency pickoffs with pulse output amplifier

Ambient Temperature	-40…85℃
Operating Temperature	VH -200…400℃
	RH -40…200℃
Other parameters please refer to the above	

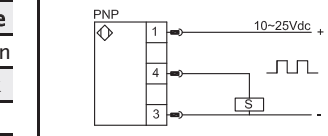
Wiring – Pulse Output

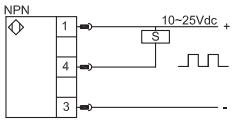
Wiring	PNP output	NPN output

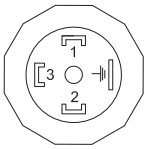


M12x1plug

Signal	Plug	Cable
U+	1	Brown
Pulse	4	Black
U-	3	Blue

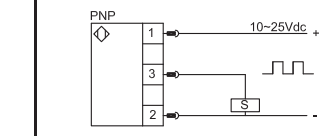


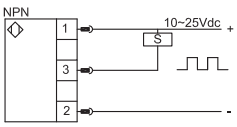




Solenoid plug

Signal	Plug
U+	1
Pulse	3
U-	2





VA – Magnetic pickoffs with analog output amplifier
RA – Carrier frequency pickoffs with analog output amplifier

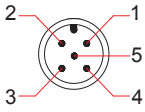
Power Supply	12...30VDC
Current Consumption	Voltage analog output: 7mA
	Current analog output: <12mA
Outputs	0...10V
	3-wire (0) 4...20mA
Reverse Polarity Proof	Yes
Short-circuit Proof	Yes
Operating Temperature	-40...120℃
Ambient Temperature	-40...85℃
Electrical Connection	M12x1plug
	DIN43650-A plug (solenoid plug)
Protection Class	M12X1plug: IP67
	DIN43650-A plug: IP65

VAH – High temperature magnetic pickoffs with analog output amplifier
RAH – High temperature carrier frequency pickoffs with analog output amplifier

Ambient Temperature	-40...85℃
Operating Temperature	VAH -200...400℃
	RAH -40...200℃
Other parameters please refer to the above	

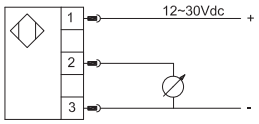
Wiring – Analog Output: 3 – Wiring 4...20mA

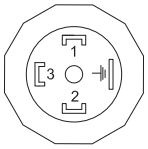
Wiring	4...20mA (3-wire)



M12x1plug

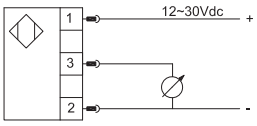
Signal	Plug	Cable
U+	1	Brown
output	2	White
U-	3	Blue





Solenoid plug

Signal	Plug
U+	1
output	3
U-	2



DWEVS – Smart control unit with magnetic pickoffs
DWERS – Smart control unit with carrier frequency pickoffs

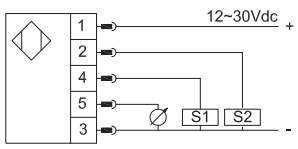
Power Supply (Us)	12...30Vdc
Current Consumption	<20mA
Switching Output	
Output	Push-pull (compatible with PNP / NPN)
Current	500mA(power supply 24Vdc)
Current Analog Output	
Output	3/2-wire 4...20mA programable
Load RA（Ω）	RA≤ (Us-10) /0.02
Linearity	≤±0.5% of reading
Voltage Analog Output	
Output	3-wire 0...5V/1...5V programable
Load RA（Ω）	RA≥5KΩ
Linearity	≤±0.5% of reading
Accuracy	≤±0.5% of reading
Temperature	
Operating Temperature	-40...120℃
Ambient/Storage	-40...85℃
Display	8mm height, red 4-digit LED
Material	
Display Head	304 stainless steel (316L customized) + PP
Housing	304 stainless steel (316L customized)
Protection Class	IP67
Electrical Connection	M12×1plug

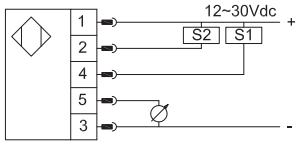
DWEVH – Smart control unit with high temperature magnetic pickoffs
DWERH – Smart control unit with high temperature carrier frequency pickoffs

Ambient Temperature	-40...85℃
Operating Temperature	-40...200℃
Other parameters please refer to the above	

Wiring

PNP output	NPN output
2xPNP + analog output	2xNPN + analog output





ETLFlow

Order Code

ETLFLOW-300F: Turbine flow meter

Thread type

GF : BSPP female thread （G thread）

NF : NPT female thread

Nominal diameter

04 : DN4 thread size G1/4 or 1/4"NPT

06 : DN6 thread size G1/4 or 1/4"NPT

10 : DN10 thread size G3/8 or 3/8"NPT

15 : DN15 thread size G1/2 or 1/2"NPT

20 : DN20 thread size G3/4 or 3/4"NPT

25 : DN25 thread size G1 or 1"NPT

32 : DN32 thread size G1-1/4 or 1-1/4"NPT

40 : DN40 thread size G1-1/2 or 1-1/2"NPT

Bearing

BB : Stainless steel ball bearing (unavailable for DN4 and DN6)

TC : Tungsten carbide journal bearing

CC : Ceramic journal bearing

ETLFLOW-300F	GF	15	BB	B	170L	1	VS	-	H

Accuracy

A : 0.2% of reading **C :** 1% of reading

B : 0.5% of reading **S :** Customized

Measuring range (see technical data for details)

4.5L : Upper flow limit 4.5L/min **130L :** Upper flow limit 130L/min

10L : Upper flow limit 10L/min **170L :** Upper flow limit 170L/min

20L : Upper flow limit 20L/min **250L :** Upper flow limit 250L/min

100L : Upper flow limit 100L/min **320L :** Upper flow limit 320L/min

Turndown ratio (Upper flow limit : lower flow limit)

1 : 10:1 **3 :** 30:1 **5 :** 50:1

2 : 20:1 **4 :** 40:1

Note: Meter with wide turndown ratio (40:1 or 50:1) should be used with carrier frequency pickoffs and stainless steel ball bearing.

Pickoffs type (see technical data for details)

VS : magnetic pickoffs with pulse output amplifier

VH : High temperature magnetic pickoffs with pulse output amplifier

VA : magnetic pickoffs with analog output amplifier

VAH : High temperature magnetic pickoffs with analog output amplifier

RS: Carrier frequency pickoffs with pulse output amplifier

RH: High temperature carrier frequency pickoffs with pulse output amplifier

RA: Carrier frequency pickoffs with analog output amplifier

RAH: High temperature carrier frequency pickoffs with analog output amplifier

DWEVS : Smart control unit with magnetic pickoffs

DWEVH : Smart control unit with high temperature magnetic pickoffs

DWERS : Smart control unit with carrier frequency pickoffs

DWERH : Smart control unit with high temperature carrier frequency pickoffs

Outputs

- : Pulse **A420 :** 4...20mA **V005 :** 0...5V

A020 : 0...20mA **V010 :** 0...10V **V105 :** 1...5V

Electrical connection

H : DIN43650-A plug (unavailable for DWE series)

S : M12X1 plug

ETLFlow

High Accuracy Turbine Flow Meter with Male Thread

ETLFLOW-300M-EO - Metric Male Threads with Ermeto 24° Cone Fittings
ETLFLOW-300M-OL - Metric Male Threads with O-ring Face Seal Ends (ISO843)
ETLFLOW-300M-NM - NPT Male Threads

- **High pressure resistance**
- **Low pressure loss**
  Fast response time
- **High repeatability and accuracy**
  Resistant to contamination
- **Pulse / analog output selectable**

Fluid flowing through ETLFLOW-300M causes the rotor to revolve. As the rotor blade pass the pickoffs, electrical pulses are produced in which frequency is proportional to the flow rate. **The revolutions per minute and the K-factor (number of** pulses/litre) make it possible to obtain the flow volume passing through the unit.

ETLFLOW-300M series are used to measure medium or lower viscosity media, such as water, light fuel, solvent, hydraulic oil, lubricating oil etc.

Specifications

Nominal Diameter	ETLFLOW-300M-EO metric male threads with Ermeto 24° cone fittings	DN4...DN32
	ETLFLOW-300M-OL metric male threads with O-ring face seal ends (ISO8434-3)	DN4...DN40
	ETLFLOW-300M-NM NPT male thread	DN10...DN4
Applicable Medium	Medium or lower viscosity liquids	
Accuracy	Better than ±1% of reading，±0.5% /±0.2% selectable	
Repeatability	±0.1% of reading	
Pressure Rating	MAX. 420bar	
Ambient Temperature	-40...85℃	
Medium Temperature	-40...120℃，-200...400℃ (high temprature type)	
Materials		
Body / Rotor Support	304 stainless steel (316 stainless steel optional)	
Turbine	Stainless steel	
Shaft	Tungsten carbide/ceramic	
Bearing	Stainless steel ball bearing,	
	Tungsten carbide/ceramic journal bearing	
Process Connection	...EO, ...OL, ...NM	

Applications

- Petrochemical/energy industry
- **Hydraulic/lubrication** system
- Water treatment
- **Oil / gas industry**
- Test systems

Parameter Table

Types	Measuring Range (L/Min)		DN (mm)	Max. Pressure Rating（bar）			Filtration (micron)	
	Magnetic pickoff	Carrier frequency pickoff		...EO metric male threads with Ermeto 24°	...OL metric male threads with O-ring	...NM NPT male thread	Journal bearing	Ball bearing
ETLFLOW-300M...4.5L	0.6-4.5	0.3—4.5	4	400 (M14×	400 (M18×1.5)	400 (1/4")	75	-
ETLFLOW-300M...10L	1.6-10	0.8—10	6	400 (M16×1.5)	400 (M22×1.5)	300 (3/8")	75	-
ETLFLOW-300M...20L	3-20	1.5—20	10	400 (M24×1.5)	400 (M27×1.5)	250 (1/2")	100	30
ETLFLOW-300M...100L	10-100	5—100	15	400 (M36×2)	300 (M36×2)	250 (3/4")	150	50
ETLFLOW-300M...130L	13-130	6—130	20	250 (M42×2)	250 (M42×2)	250 (1")	150	50
ETLFLOW-300M...170L	17-170	8—170	25	250 (M52×2)	250 (M45×2)	250 (1-1/4")	150	70
ETLFLOW-300M...250L	25-250	12—250	32	160 (M52×2)	160 (M60×2)	160 (1-1/2")	200	100
ETLFLOW-300M...320L	32-320	16—320	40	-	160 (M64×2)	160 (2")	200	100

Pickoffs & Amplifiers

ETLFLOW-300M can be integrated with several different pickoffs, preamplifiers and signal conditioners, such as magnetic pickoffs, carrier frequency pickoffs, linear correction preamplifiers, smart control units, to meet specific measurement needs.

Pickoffs

Magnetic pickoffs can sense a ferrous rotor and is ideal for use in all types of ETL FLOW turbine flow meters. Options include **cryogenic, high temperature and explosion proof**.

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Amplifiers

ETL FLOW has developed a line of preamplifiers and signal conditioners for installation with our pickoffs . Our offerings include preamplifiers in several different configurations.

Pulse output amplifier – Output with square signal, proportional to the flow rate.
Amplifier with linearized pulse output – Extending the measuring range and with multi-point linearization, with square wave output, frequency proportional to the flow rate.
Amplifier with analog output – Current analog output or voltage analog output, such as 0-10V, 0-5V, 0-20mA, 4- 20mA.
Amplifier with linearized analog output – Extended measuring range and with multi-point linearization, analog output.
Intelligent flow computer – Digital display, analog output / communication RS485/ switch output optional.

Bearings

Bearings are available in three styles, stainless steel ball , tungsten carbide journal sleeve and ceramic journal sleeve. Ceramic bearing eliminate adhesive wear and perform well in low or non-lubricating liquids found in cryogenic fluids and water. Ball **bearings have the least amount of drag, thus provide the widest capable flow range. Journal bearings create more drag**, therefore reducing the turndown capability of the flow meter.

Tungsten carbide journal bearing – Applicable to low or non-lubricating media, narrow turndown ratio of the flow meter relative with ball bearing.
Stainless steel ball bearing – Applicable to lubricating media, with low friction, lower limit for flow meter and wider turndown ratio.
Ceramic journal bearing – Self-lubricating, applicable to non-lubricating media such as liquid nitrogen, narrow turndown ratio of the flow meter relative with ball bearing.

Electronics

ETLFLOW-300M series assembled with below pickoffs:

VS - Magnetic pickoffs with pulse output amplifier
RS - Carrier frequency pickoffs with pulse output amplifier

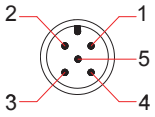
Power Supply	12...30VDC
Current Consumption	8mA
Outputs	NPN OC output; NPN OC output+pull-up resistor
Reverse Polarity Proof	Yes
Short-circuit Proof	Yes
Operating Temperature	-40...120℃
Ambient Temperature	-40...85℃
Electrical Connection	M12x1plug
	DIN43650-A plug (solenoid plug)
Protection Class	M12X1plug: IP67
	DIN43650-A plug: IP65

VH - High temperature magnetic pickoffs with pulse output amplifier
RH - High temperature carrier frequency pickoffs with pulse output amplifier

Ambient Temperature	-40...85℃
Operating Temperature	VH -200...400℃
	RH -40...200℃
Other parameters please refer to the above	

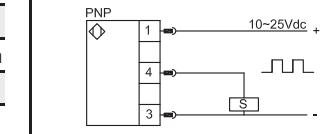
Wiring – Pulse Output

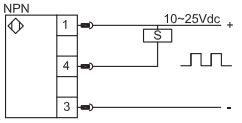
Wiring	PNP output	NPN output

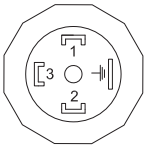


M12x1plug

Signal	Plug	Cable
U+	1	Brown
Pulse	4	Black
U-	3	Blue

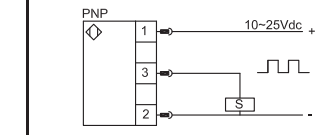


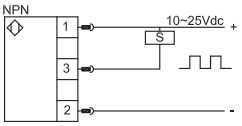




Solenoid plug

Signal	Plug
U+	1
Pulse	3
U-	2





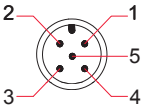
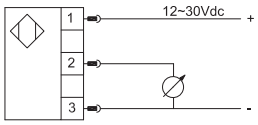
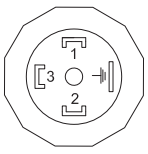
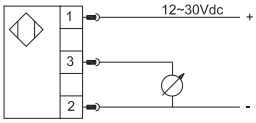
VA - Magnetic pickoffs with analog output amplifier
RA - Carrier frequency pickoffs with analog output amplifier

Power Supply	12...30VDC
Current Consumption	Voltage analog output: 7mA
	Current analog output: <12mA
Outputs	0...10V
	3-wire (0) 4...20mA
Reverse Polarity Proof	Yes
Short-circuit Proof	Yes
Operating Temperature	-40...120℃
Ambient Temperature	-40...85℃
Electrical Connection	M12x1plug
	DIN43650-A plug (solenoid plug)
Protection Class	M12X1plug: IP67
	DIN43650-A plug: IP65

VAH - High temperature magnetic pickoffs with analog output amplifier
RAH - High temperature carrier frequency pickoffs with analog output amplifier

Ambient Temperature	-40...85℃
Operating Temperature	VAH -200...400℃
	RAH -40...200℃
Other parameters please refer to the above	

Wiring - Analog Output: 3 - Wiring 4...20mA

Wiring				4...20mA (3-wire)
 M12x1plug	**Signal**	**Plug**	**Cable**	
	U+	1	Brown	
	output	2	White	
	U-	3	Blue	
 Solenoid plug	**Signal**	**Plug**		
	U+	1		
	output	3		
	U-	2		

DWEVS – Smart control unit with magnetic pickoffs
DWERS – Smart control unit with carrier frequency pickoffs

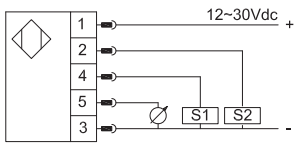
Power Supply (Us)	12...30Vdc
Current Consumption	<20mA
Switching Output	
Output	Push-pull (compatible with PNP / NPN)
Current	500mA(power supply 24Vdc)
Current Analog Output	
Output	3/2-wire 4...20mA programable
Load RA（Ω）	RA≤ (Us-10) /0.02
Linearity	≤±0.5% of reading
Voltage Analog Output	
Output	3-wire 0...5V/1...5V programable
Load RA（Ω）	RA≥5KΩ
Linearity	≤±0.5% of reading
Accuracy	≤±0.5% of reading
Temperature	
Operating Temperature	-40...120℃
Ambient/Storage	-40...85℃
Display	8mm height, red 4-digit LED
Material	
Display Head	304 stainless steel (316L customized) + PP
Housing	304 stainless steel (316L customized)
Protection Class	IP67
Electrical Connection	M12×1plug

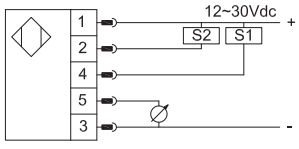
DWEVH – Smart control unit with high temperature magnetic pickoffs
DWERH – Smart control unit with high temperature carrier frequency pickoffs

Ambient Temperature	-40...85℃
Operating Temperature	-40...200℃
Other parameters please refer to the above	

Wiring

PNP output	NPN output
2xPNP + analog output	2xNPN + analog output





ETLFlow

Order Code

ETLFLOW-300M	Turbine flow meter
Thread type	
EO:	Metric male threads with Ermeto 24° cone fittings
OL:	Metric male threads with O-ring face seal ends (ISO8434-3)
NM:	NPT male thread
Nominal diameter (see parameter table for details)	
04 :	DN4 thread size
06 :	DN6 thread size
10 :	DN10 thread size
15 :	DN15 thread size
20 :	DN20 thread size
25 :	DN25 thread size
32 :	DN32 thread size
40 :	DN40 thread size
Bearing	
BB :	Stainless steel ball bearing (unavailable for DN4 and DN6)
TC :	Tungsten carbide journal bearing
CC :	Ceramic journal bearing

ETLFLOW-300M	EO	15	BB	B	170L	1	VS	-	H

Accuracy

A :	0.2% of reading	**C :**	1% of reading
B :	0.5% of reading	**S :**	Customized

Measuring range (see parameter table for details)

4.5L :	Upper flow limit 4.5L/min	**130L :**	Upper flow limit 130L/min
10L :	Upper flow limit 10L/min	**170L :**	Upper flow limit 170L/min
20L :	Upper flow limit 20L/min	**250L :**	Upper flow limit 250L/min
100L :	Upper flow limit 100L/min	**320L :**	Upper flow limit 320L/min

Turndown ratio (Upper flow limit : lower flow limit)

1 :	10:1	**3 :**	30:1	**5 :**	50:1
2 :	20:1	**4 :**	40:1		

Note: Meter with wide turndown ratio (40:1 or 50:1) should be used with carrier frequency pickoffs and stainless steel ball bearing.

Pickoffs type (see electronics for details)

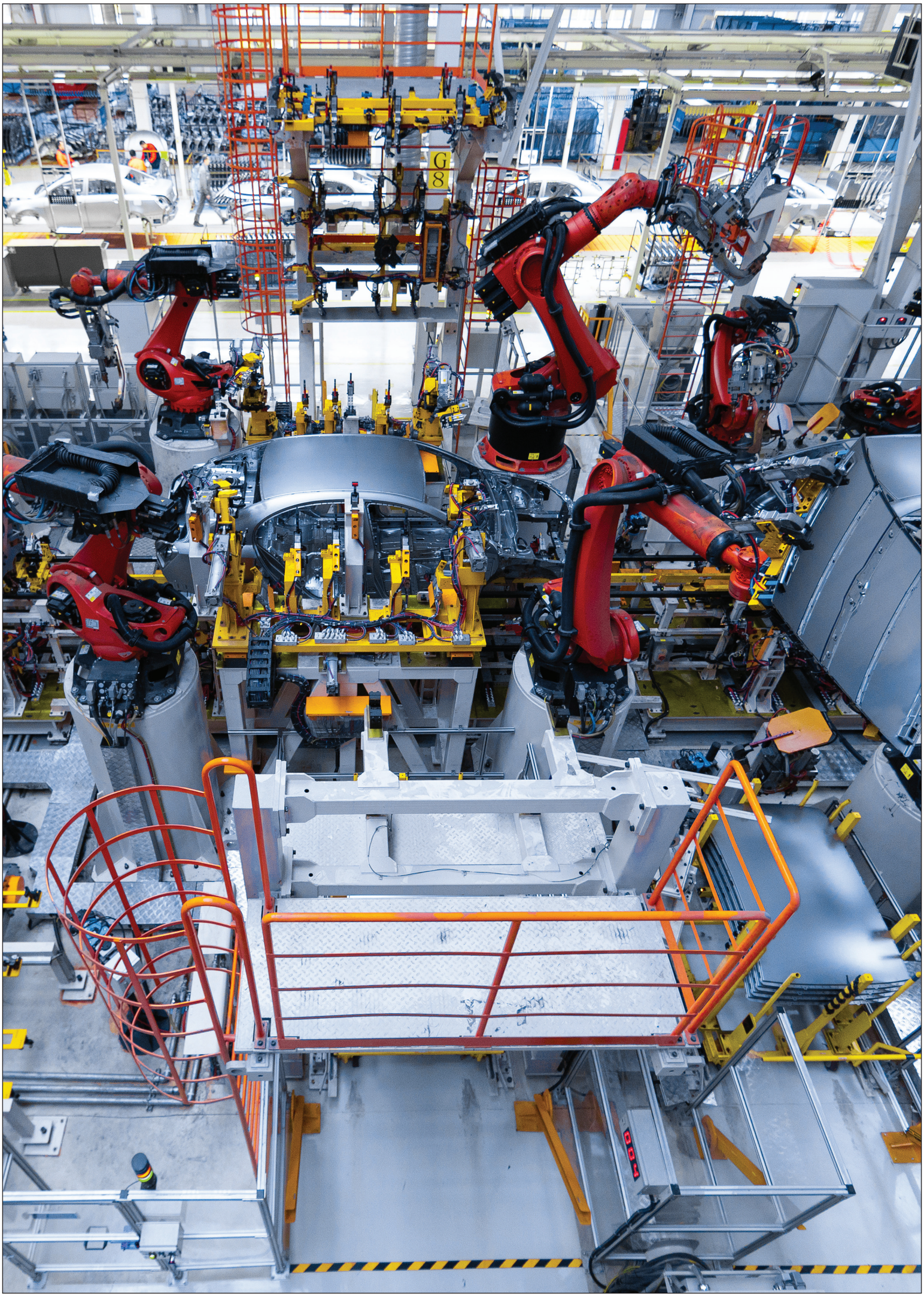
VS :	magnetic pickoffs with pulse output amplifier
VH :	High temperature magnetic pickoffs with pulse output amplifier
VA :	magnetic pickoffs with analog output amplifier
VAH :	High temperature magnetic pickoffs with analog output amplifier
RS:	Carrier frequency pickoffs with pulse output amplifier
RH:	High temperature carrier frequency pickoffs with pulse output amplifier
RA:	Carrier frequency pickoffs with analog output amplifier
RAH:	High temperature carrier frequency pickoffs with analog output amplifier
DWEVS :	Smart control unit with magnetic pickoffs
DWEVH :	Smart control unit with high temperature magnetic pickoffs
DWERS :	Smart control unit with carrier frequency pickoffs
DWERH :	Smart control unit with high temperature carrier frequency pickoffs

Outputs

- :	Pulse	**A420 :**	4...20mA	**V005 :**	0...5V
A020 :	0...20mA	**V010 :**	0...10V	**V105 :**	1...5V

Electrical connection

H :	DIN43650-A plug (unavailable for DWE series)
S :	M12X1 plug


G
8

ETLN3 Turbine Flow Meter

This range of flowmeters will provide you with a highly accurate way of measuring liquids over the range of 0.7 to 2,250 litres/min.

Application

This range of flowmeters is used for liquids such as water, light oils, solvents and low viscosity chemicals. You can use them for batching, flow rate monitoring, controlling, blending and filling. The flowmeter is highly accurate and often used for testing the performance of pumps, engines, valves and other flowmeters.

In hazardous areas you can use the flowmeters with the IS pick-off coil approved to ATEX II 1 G EEx ia IIC T5. The signal can be used in the IS area or transmitted to the safe area using the intrinsically safe P5 preamplifier and suitable barriers.

Instrumentation

The signal can be used for a local display, remote display or converted for transmission to a separate control system. We have a range of instruments to suit all your requirements.

Principle Of Operation

When liquid flows and the rotor turns, the sensor detects the movement of the blade tips and generates pulses. The pulse frequency is proportional to the flow rate.

Construction

The stainless steel construction is durable and gives excellent corrosion resistance. The rotor is machined from solid, making it virtually indestructible. The sleeve bearings provide you with highly reliable performance over long periods.

Calibration

All ETLN3 turbine flowmeters are individually calibrated with water or oil and are traceable to national standards.

We provide you with a test certificate for each meter showing the number of pulses per litre, which is used to set the instrumentation.

Features

- Highly accurate measurement of flow
  Well proven
  Improve product quality
  Reduce costs and waste
- Robust stainless steel construction
  Corrosion resistant
  Very low maintenance and down time
  Withstands high temperature and pressure
- High quality manufacture
  ISO 9001 certified company
  Approvals for use in hazardous areas
  Individual calibration certificates
- Low pressure drop
- Bi-directional flow capability

Installation

The flowmeter is installed directly into the pipeline.
To reduce turbulence and get the best results from your flowmeter we recommend that you install it in a straight section of pipe with at least 10 pipe diameters upstream and 5 pipe diameters downstream.

Control valves should be installed downstream of the flowmeter. To prevent foreign particles blocking your line we recommend you install a filter before the flowmeter.

Preamplifiers are only needed if you have very long transmission distances or an electrically noisy environment close to pumps, motors, generators, switchgear or heavy current carrying cables. Intrinsically safe systems always require an IS pick-off coil. The IS P5 preamplifier is required for transmission to a safe area through barriers.

ETLN3 Turbine Flow Meter

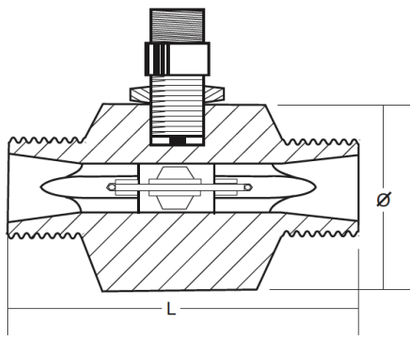
Specification

Linearity:	Better than +/- 0.5% of reading
Repeatability:	+/-0.1% of reading
Pressure drop:	0.5 bar at maximum flow
Maximum over range:	Up to 120% of the maximum flow rate for short durations
Maximum working pressure:	15,000 psi (Depending on connection).
Temperature range:	Standard pickoff -30°C to 110°C
Body connections:	BSP parallel thread with 600 cone special connections are available for hydraulic applications

Materials Of Construction

Body:	316 Stainless steel
Sleeve bearings:	Standard - carbon graphite filled PTFE (max temp. 180°C) Optional tungsten carbide (max temp. 300°C)
Thrust balls:	Tungsten carbide
Rotor:	431 s/s or ferralium
Rotor shaft:	Tungsten carbide
Hangers:	316 Stainless steel
Circlips:	316 Stainless steel

Model No	Flow Range Ltr/min	K factor # pulses / litre
ETLN3/10	1 - 10	5000
ETLN3/15	2 - 20	3800
ETLN3/20/5	5 - 50	1080
ETLN3/20/8	8 - 80	1080
ETLN3/25/15	15 - 150	620
ETLN3/25	25 - 250	362
ETLN3/32	45 - 450	111
ETLN3/40	67 - 670	82
ETLN3/50	110 - 1100	59
ETLN3/65	225 - 2250	19



Dimensions

Model Number	Thread Size BSP	L mm	Dia mm	Weight kg
ETLN3/10	3/8"	82.6	38.0	0.3
ETLN3/15	1/2"	82.6	50.0	0.5
ETLN3/20/5	3/4"	82.6	50.0	0.5
ETLN3/20/8	3/4"	82.6	50.0	0.5
ETLN3/25/15	1"	90.5	63.5	1.0
ETLN3/25	1"	90.5	63.5	0.8
ETLN3/32	1 1/4"	110.0	75.0	1.6
ETLN3/40	1 1/2"	116.7	76.2	1.7
ETLN3/50	2"	154.0	89.0	3.1
ETLN3/65	2 1/2"	170.0	95.0	3.5

The nominal K factor is based on water at 20°C

Each flowmeter is individually calibrated on water and will have a unique K factor.

Complete range of Total and Rate displays available.

ETLFlow

ETLN4 Turbine Flow Meter

This flanged range of flowmeters will provide you with a highly accurate way of measuring liquids over the range of 2 to 9000 litres/min.

Application

This range of flowmeters is used for liquids such as water, light oils, solvents and low viscosity chemicals. You can use them for batching, ow rate monitoring, controlling, blending and filling. The flowmeter is highly accurate and often used for testing the performance of pumps, engines, valves and other flowmeters.

In hazardous areas you can use the flowmeters with the IS pick-off coil approved to ATEX II 1 G EEx ia IIC T5. The signal can be used in the IS area or transmitted to the safe area using the intrinsically safe P5 preamplifier and suitable barriers.

Instrumentation

The signal can be used for a local display, remote display or converted for transmission to a separate control system. We have a range of instruments to suit all your requirements.

Principle Of Operation

When liquid flows and the rotor turns, the sensor detects the movement of the blade tips and generates pulses. The pulse frequency is proportional to the flow rate.

Construction

The stainless steel construction is durable and gives excellent corrosion resistance. The rotor is machined from solid, making it virtually indestructible. The sleeve bearings provide you with highly reliable performance over long periods.

Calibration

All ETLN4 turbine flowmeter are individually calibrated with water or oil and are traceable to national standards.

We provide you with a test certificate for each meter showing the number of pulses per litre, which is used to set the instrumentation.

Features

- Highly accurate measurement of flow
  Well proven
  Improve product quality
  Reduce costs and waste
- Robust stainless steel construction
  Corrosion resistant
  Very low maintenance and down time
  Withstands high temperature and pressure
- High quality manufacture
  ISO 9001 certified company
  Approvals for use in hazardous areas
  Individual calibration certificates
- Low pressure drop
- Bi-directional flow capability

Installation

The flowmeter is installed directly into the pipeline.
To reduce turbulence and get the best results from your flowmeter we recommend that you install it in a straight section of pipe with at least 10 pipe diameters upstream and 5 pipe diameters downstream.

Control valves should be installed downstream of the flowmeter.

To prevent foreign particles blocking your line we recommend you install a filter before the flowmeter. Preamplifiers are only needed if you have very long transmission distances or an electrically noisy environment close to pumps, motors, generators, switchgear or heavy current carrying cables. Intrinsically safe systems always require an IS pick-off coil. The IS P5 preamplifier is required for transmission to the safe area through barriers.

ETLN4 Turbine Flow Meter

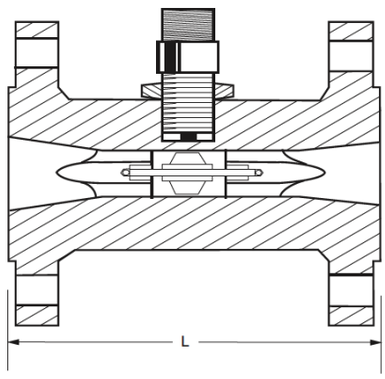
Specification

Linearity:	Better than +/- 0.5% of reading
Repeatability:	+/-0.1% of reading
Pressure drop:	0.5 bar at maximum flow
Maximum over range:	Up to 120% of the maximum flow rate for short durations
Maximum working pressure:	Subject to flange rating
Temperature range:	Standard pickoff -30°C to 110°C IS pick-off -30°C to 110°C High temp. -30°C to 232°C
Flanged connections:	ANSI 150, ANSI 300 DIN PN16, PN40

Materials Of Construction

Body:	316 Stainless steel
Sleeve bearings:	Up to 500mm - carbon graphite filled PTFE (max temp. 1800°C) Optional tungsten carbide 80mm and above tungsten carbide (max temp. 3000°C)
Thrust balls:	Tungsten carbide or ceramic
Rotor:	431 s/s or ferralium
Rotor shaft:	Tungsten carbide
Hangers:	316 Stainless steel
Circlips:	316 Stainless steel

Model No	Flow Range Ltr/min	K factor # pulses / litre
ETLN4/20/5	5 - 50	1080
ETLN4/20/8	8 - 80	1080
ETLN4/25/15	15 - 150	620
ETLN4/25	25 - 250	362
ETLN4/32	45 - 450	250
ETLN4/40	67 - 670	70
ETLN4/50	110 - 1100	59
ETLN4/80	225 - 2250	14
ETLN4/100	450 - 4500	6.6
ETLN4/150	900 - 9000	2.3



Dimensions

Model Number	Thread Size BSP	L mm	Weight kg
ETLN4/20/5	20	139.7	2.0
ETLN4/20/8	20	139.7	2.0
ETLN4/25/15	25	139.7	2.2
ETLN4/25	25	139.7	2.7
ETLN4/32	32	145.0	3.9
ETLN4/40	40	152.4	6.5
ETLN4/50	50	165.1	8.4
ETLN4/80	80	250.0	14.5
ETLN4/100	100	300.0	16.5
ETLN4/150	150	360.0	16.5

The nominal K factor is based on water at 20°C

Each flowmeter is individually calibrated on water and will have a unique K factor.

Complete range of Total and Rate displays available.

ETLFlow

Positive Displacement Gear Meters

Positive Displacement Gear Meters, suitable for paint & adhesives, test rig monitoring, Hydraulics, cylinder positioning.

Highly accurate wide range and turndown ratios, various material and pressure options up to 15,000 psi.

Ideal for measuring oil, fuel, skydrol, and any non abrasive, mid range viscosity fluids.

With a wide range of outputs and displays most applications are catered for.

ETLFLOW-200 Positive Displacement Flow Meter (Gear Flow Meter)

- **High pressure rating**
- **Applicable to various viscous media**
- **High repeatability and accuracy**
- **Pulse / analog output selectable**
- **Wide measuring range**

ETLFLOW-200 positive displacement flow meter measures the flow on the volumetric principle, in which gearwheels are moved proportional to the flow rate. The movement of the gearwheels is measured through the enclosing housing wall by a sensor.

Immune to medium viscosity. Higher trundown ratio, accuracy, resolution and responsibility, as well as for measuring the very-low flow.

ETLFLOW-200 flow meters are bi-directional and can be used to measure the cylinder position without damaging internal parts.

Assembled with journal bearings ETLFLOW-200 can measure low or non-lubricating fluids, such as paints, glues, resin, sealant etc.

The ETLFLOW-200 series of positive displacement flow meters have 8 measuring ranges from 0.006 ... 1L/min through 4.0 ... 450L/min. Optional pickoffs for pulse output, current analog output and voltage analog output.

Specifications

Applicable Medium	Liquids
Accuracy (at 30cst)	±0.5% of reading (turndown ratio of 1:10); ±1% of reading (measuring range)
Repeatability	±0.1% of reading
Pressure Rating	420bar (stainless steel); 100bar (aluminum)
Ambient Temperature	-40...85℃
Medium Temperature	-40...100℃ (Max. 200℃ for high temperature type)
Materials	
Body	316 stainless steel or aluminum
Gear	Stainless steel
Sealing	FPM (NBR, PTFE optional)
Bearing	Stainless steel ball bearing
	Tungsten carbide journal bearing

Applications

- Printing ink measurement
- Resin/glue/silica gel measurement
- Hydraulic oil/lubricating oil/ grease measurement
- Cooling liquid measurement
- Solvent measurement
- Fuel oil measurement
- Polyurethane measurement
  Braking fluid measurement
- Cylinder position measurement

Parameter Table

Parameter of Meter	Measuring Range (L/Min)	K Coefficient (IMPULSE/L)	Max. Pressure Rating (bar)		Connection BSPP/NPT	Max. Filter Diameter (micron)	
			316 Steel	Aluminum		Journal Bearing	Ball Bearing
ETLFLOW-200...1L	0.006—1.0	40000	420	100	G1/8 or NPT1/8	120	30
ETLFLOW-200...3L	0.02—3.0	13500	420	100	G1/4 or NPT1/4	120	30
ETLFLOW-200...7.5L	0.05—7.5	4200	420	100	G1/4 or NPT1/4	120	30
ETLFLOW-200...25L	0.2—25	1400	420	100	G1/2 or NPT1/2	120	30
ETLFLOW-200...75L	0.5—75.0	450	420	100	G3/4 or NPT3/4	175	30
ETLFLOW-200...150L	1.5—150.0	190	420	100	G1 or NPT1	300	200
ETLFLOW-200...225L	2.0—225.0	110	420	100	G1-1/4 or NPT1-1/4	300	200
ETLFLOW-200...450L	4.0—450.0	55	420	100	G1-1/4 or NPT1-1/4	300	200

ETLFlow

Electronics

ETLFLOW-200 series assembled with below pickoffs:

GS – Single hall effect pickoff with pulse output amplifier

Power Supply	12…30VDC
Current Consumption	8mA
Outputs	NPN OC output; NPN OC output+pull-up resistor
Reverse Polarity Proof	Yes
Short-circuit Proof	Yes
Operating Temperature	-40…120℃
Ambient Temperature	-40…85℃
Electrical Connection	M12x1plug
	DIN43650-A plug (solenoid plug)
Protection Class	M12X1plug: IP67
	DIN43650-A plug: IP65

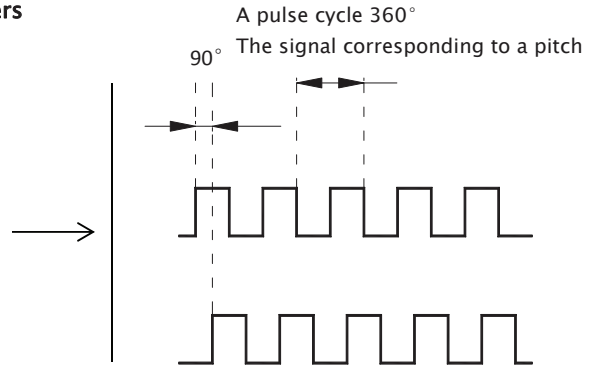
GH – Single high temperature hall effect pickoff with pulse output amplifier

Ambient Temperature	-40…85℃
Operating Temperature	-40…200℃
Other parameters please refer to the above	

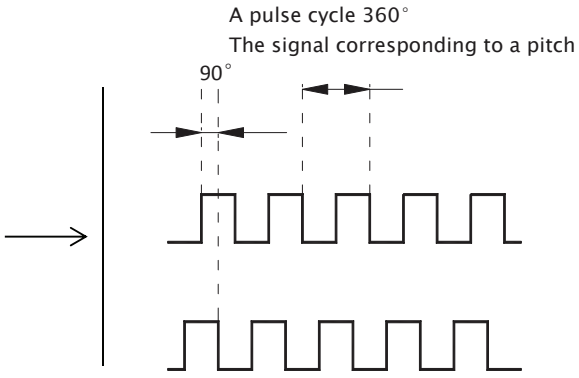
GD – Dual hall effect pickoffs with pulse output amplifiers

GDH – Dual high temperature hall effect pickoffs with pulse output amplifiers

Direction 1: Output 1is rising 90 ° ahead of output 2.



Direction 2: Output 1is rising 90 ° behind output 2.



AS – Hall effect pickoff with analog output amplifier

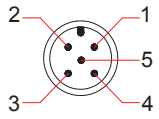
Power Supply	12...30VDC
Current Consumption	Voltage analog output: 7mA
	Current analog output: <12mA
Outputs	0...10V
	3-wire (0) 4...20mA
Reverse Polarity Proof	Yes
Short-circuit Proof	Yes
Operating Temperature	-40...120℃
Ambient Temperature	-40...85℃
Electrical Connection	M12x1plug
	DIN43650-A plug (solenoid plug)
Protection Class	M12X1plug: IP67
	DIN43650-A plug: IP65

AH – High temperature hall effect pickoff with analog output amplifier

Ambient Temperature	-40...85℃
Operating Temperature	-40...200℃
Other parameters please refer to the above	

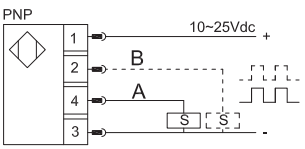
Wiring 1 – Pulse Output

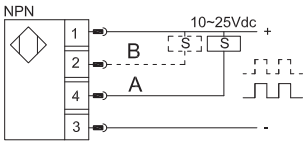
Wiring	PNP output	NPN output

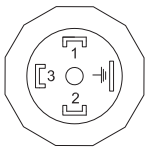


M12x1Plug

Signal	Plug	Cable
U+	1	Brown
Pulse	4	Black
U-	3	Blue

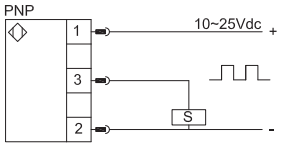


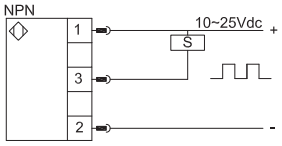




Solenoid Plug

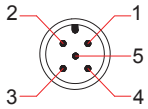
Signal	Plug
U+	1
Pulse	3
U-	2





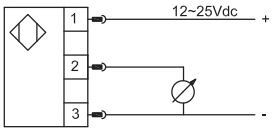
Wiring 2 – Analog Output : 3-wiring 4...20mA/0...10V

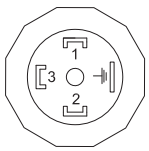
Wiring	4...20mA/0...10V (3-wire)



M12x1Plug

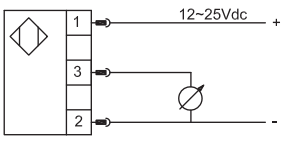
Signal	Plug	Cable
U+	1	Brown
output	2	White
U-	3	Blue





Solenoid Plug

Signal	Plug
U+	1
output	3
U-	2



ETLFlow

DWEG – Smart control unit with hall effect pickoff

Power Supply (Us)	12...30Vdc
Current Consumption	<20mA
Switching Output	
Output	Push-pull (compatible with PNP / NPN)
Current	500mA(power supply 24Vdc)
Current Analog Output	
Output	3/2-wire 4...20mA programable
Load RA（Ω）	RA≤ (Us-10) /0.02
Linearity	≤±0.5% of reading
Voltage Analog Output	
Output	3-wire 0...5V/1...5V programable
Load RA（Ω）	RA≥5KΩ
Linearity	≤±0.5% of reading
Accuracy	≤±0.5% of reading
Temperature	
Operating Temperature	-40...120℃
Ambient/Storage	-40...85℃
Display	8mm height, red 4-digit LED
Material	
Display Head	304 stainless steel (316L customized) + PP
Housing	304 stainless steel (316L customized)
Protection Class	IP67
Electrical Connection	M12×1plug

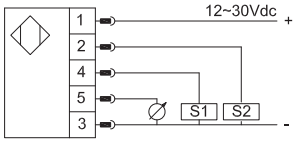
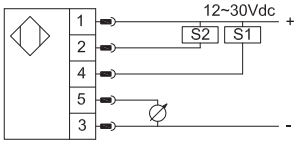
DWEGH – Smart control unit with high temperature hall effect pickoff

Ambient Temperature	-40...85℃
Operating Temperature	-40...200℃
Other parameters please refer to the above	

DWEGD – Smart control unit with dual hall effect pickoffs (recognition of flow direction)

DWEGDH – Smart control unit with dual high temperature hall effect pickoffs (recognition of flow direction, for details please refer to GD)

Wiring

PNP output	NPN output
2xPNP + analog output 	2xNPN + analog output 

ETLFlow

Order Code

ETLFLOW-200 Positive displacement flow meter (Gear flow meter)

Process connection

G1/4 :	Thread size G1/4 (corresponding measuring range 1L/ 3L/7.5L)
G1/2 :	Thread size G1/2 (corresponding measuring range 25L)
G3/4 :	Thread size G3/4 (corresponding measuring range 75L)
G1 :	Thread size G1 (corresponding measuring range 150L)
G1-1/4 :	Thread size G1-1/4 (corresponding measuring range 225L/450L)
NPT1/4 :	Thread size NPT1/4 (corresponding measuring range 1L/ 3L/7.5L)
NPT1/2 :	Thread size NPT1/2 (corresponding measuring range 25L)
NPT3/4 :	Thread size NPT3/4 (corresponding measuring range 75L)
NPT1 :	Thread size NPT1 (corresponding measuring range 150L)
NPT1-1/4 :	Thread size NPT1-1/4 (corresponding measuring range 225L/450L)

Body material

S :	316 stainless steel
A :	Aluminum

Bearing

BB :	Stainless steel ball bearing
TC :	Tungsten carbide journal bearing

ETLFLOW-200	G1/4	S	BB	N	7.5L	DWEG	A420	H

Sealing material

F :	**FPM**
N :	**NBR**
T :	**PTFE**

Measuring range (see technical data for details)

1L :	0.006—1L/min	**75L :**	0.5—75.0L/min
3L :	0.02—3.0L/min	**150L :**	1.5—150L/min
7.5L :	0.05—7.5L/min	**225L :**	2.0—225.0L/min
25L :	0.2—25L/min	**450L :**	4.0—450.0L/min

Pickoffs type (see technical data for details)

GS :	Single hall effect pickoff with pulse output amplifier
GH :	Single high temperature hall effect pickoff with pulse output amplifier
GD :	Dual hall effect pickoffs with pulse output amplifiers (recognition of flow direction)
GDH :	Dual high temperature hall effect pickoffs with pulse output amplifiers (recognition of flow direction)
AS :	Hall effect pickoff with analog output amplifier
AH:	High temperature hall effect pickoff with analog output amplifier
DWEG :	Smart control unit with hall effect pickoff
DWEGH :	Smart control unit with high temperature hall effect pickoff
DWEGD :	Smart control unit with dual hall effect pickoffs (recognition of flow direction)
DWEGDH :	Smart control unit with dual high temperature hall effect pickoffs (recognition of flow direction)

Outputs

- :	Pulse	**V005 :**	0...5V
A020 :	0...20mA	**V105 :**	1...5V
A420 :	4...20mA	**V010 :**	0...10V

Electrical connection

H :	DIN43650-A plug (unavailable for DWE series)
S :	M12X1 plug

ETL FluidExperts

ETL Fluid Experts Ltd
Environmental Technologies
Grimbald Crag Road Knaresborough North Yorkshire HG5 8PY
T +44 (0)1423 522911 E sales@etlfe.com

www.etlfluidexperts.com

bsi. ISO 9001:2015 Quality Management

bsi. OHSAS 18001 Occupational Health and Safety Management

bsi. ISO 14001:2015 Environmental Management