



## Flowmeters selection guide

- Gas and liquid flows
- Direct reading scales
- 4 to 20 mA output options
- Alarm switch options



## Influx Measurements Ltd

Influx specialise in the design and manufacture of flowmeters and accessories to suit processes requiring the measurement and control of liquids and gases.

The standard products included in this guide will fit a wide range of applications, and we are also able to design and manufacture solutions to fit more specific application needs.

## Flow Measurement- A Users Guide

This essential step-by-step guide will take you through the selection, sizing and specification of the best flowmeter to suit your application.

The selection summary opposite shows the flow measurement ranges in standard metric units, typical pipe sizes and output options available for each product type.

The units conversion and sizing data in the Technical section provide straight forward calculations to arrive at the equivalent water and air flow rates.

Material options selection is aided by use of a material suitability chart.

Once a suitable product has been selected, the specific ordering code can be identified using the coded tables on the relevant page.

Water (H <sub>2</sub> O)	Scale Code	Frame Size	Float Material
2-25	49	5	St. Steel
4-60	01		St. Steel
30-280	02		St. Steel
40-480	03	9	St. Steel
50-750	04		St. Steel
0.1-1.2	05		St. Steel
0.3-3.0	06	15	St. Steel
0.4-4.4	07		St. Steel
WA			

FRAME CODE      SCALE CODE

S V1 B 9 - WA 05

When a suitable choice has been made or in the event that any standard measurement range or product type does not exactly meet your requirements, you can discuss your application in more detail with our flow specialists, at the address shown on the back cover.

Influx meters are suitable for the measurement of most liquid and gas flowrates. Each meter type is available in standard measurement ranges for the more common liquids and gases, expressed in engineering units. Meters can also be calibrated to specific fluid and operating conditions for a particular application.

## Sizing

For approximate sizing, reference can be made to the standard air and water ranges listed below for each meter type. For fluids other than air and water or different units, the conversion factors in the Technical Data section can be used to determine the appropriate measurement range.

## Product Index

Flowmeter Type	Connection Type	Suitable Pipe Sizes (mm)	Flow Ranges (L/min)				Direct Reading	4 to 20 mA	Alarm Setpoint	Page
			Water		Air					
			min	max	min	max				
Uniflux	1/4" BSP	3 to 10	0.005	4.4	0.01	120	Y	0	0	4
Reflux	3/8"-1/2" BSP	5 to 12	0.1	12	0.5	220	Y	Y	0	6
Fluxline	1/2"-1" BSP	8 to 25	0.005	40	0.01	600	Y	N	0	8
LPL	3/8"-1" BSP	5 to 25	0.005	100	0.01	2000	Y	0	0	10
FloTrak	3/4"-2"	10 to 50	0.1	415	2	11670	Y	0	0	14
Deltaflux	1"-10"	25 to 250	50	16500	350	115000	Y	0	0	16

Y = Yes    N = No    0 = Option

## Accessories

Flowsense	Infra-red flow alarm system	18
Finetrim	Fine and ultra-fine needle valves	19

## Technical Data

Flow range tables	12
Gas Flowmeter sizing information	20
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Calibration and Accuracy	21
Recommended Materials	22
Unit conversion charts	23

# Uniflux Direct Reading Flowmeter

Uniflux



Standard, Compact and Long Series' are available in a range of materials with optional fine or ultrafine needle control valves.

The BENCH STAND used with angled connections is ideal for use in laboratories and other testing applications where panel mounting is not practical.

FLOWSENSE infra-red flow alarms can be factory mounted or retro-fitted. Details on page 18.

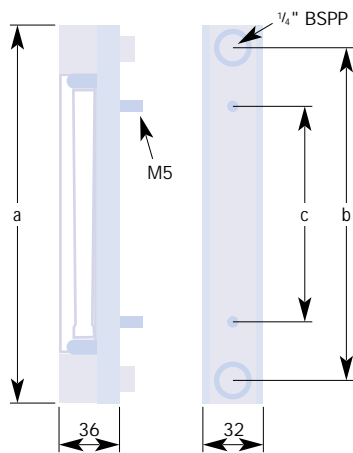


Flow tubes are available in a wide range of standard scales to suit many common fluids and operating conditions.

CUSTOMISED SCALES are also provided on request, to meet specific fluid requirements or varied conditions of use.

Flow tubes for use in ANAESTHETIC equipment are available for medical gases.

- Customised Scales
- Choice of 3 Tube Lengths
- High Repeatability
- Optional Needle Valve
- Interchangeable Flow Ranges
- Angled or Straight Connections
- Optional Alarms
- Aesthetic Styling



S V 1 B 9 - AI 05

Length  
C = Compact  
S = Standard  
L = Long

Style  
A = Angled  
S = Straight  
V1= Valved Ultra Fine  
V2= Valved Fine

Connections  
S = Stainless Steel  
B = Nickel Plated Brass

Frame Size  
5, 9 or 15  
Frame size from tables on pages 12 & 13.

Scale Code  
Obtain scale code from tables on pages 12 & 13.

If the range you require is not listed, a customised scale can be produced. Please supply: Nominal flow rate or preferred range, fluid properties (e.g. density & viscosity), units, working pressure and temperature.

mm	Compact	Standard	Long
a	133	210	250
b	108	184	226
c	65	121	121

## Specification (Standard Series)

Gas Range	5 cm <sup>3</sup> /min - 120 L/min (air equiv.)
Liquid Range	2 cm <sup>3</sup> /min - 4.4 L/min (water equiv.)
Scale Length	100mm
Accuracy Class	2.5 VDI/VDE
Repeatability	Better than 0.5%
Temperature	-15°C to 120°C
Pressure	20 bar max. (non shock)
Connections	1/4" BSP Female
Seals	Stainless steel or Nickel plated brass
Flow Tube	Viton (PTFE valve seals)
Float	Borosilicate glass
	Stainless steel, Anodised aluminium or Acetal

For standard flow ranges refer to tables on pages 12 & 13.

# Reflux Flow Transmitter

Reflux



Housing Type	Air (20°C, 1013mbar)	Float Material	Scale Code
3/8" RH	0.6 to 5 L/min	Dural	AI 48
3/8" RH	1.5 to 10 L/min	Dural	AI 40
3/8" RH	3 to 15 L/min	St.Steel	AI 41
3/8" RH	3 to 22 L/min	Dural	AI 42
3/8" RH	5 to 40 L/min	St.Steel	AI 43
3/8" RH	10 to 75 L/min	Dural	AI 44
1/2" MH	20 to 150 L/min	Dural	AI 46
1/2" MH	30 to 220 L/min	St.Steel	AI 47
1" MH	60 to 400 L/min	Dural	AI 81
1" MH	60 to 600 L/min	St.Steel	AI 82

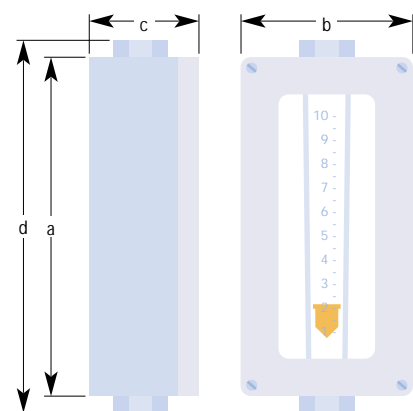
Housing Type	Water (20°C)	Float Material	Scale Code
3/8" RH	15 to 100 cm <sup>3</sup> /min	P.T.F.E.	WA 48
3/8" RH	30 to 250 cm <sup>3</sup> /min	Acetal	WA 50
3/8" RH	75 to 500 cm <sup>3</sup> /min	St.Steel	WA 41
3/8" RH	0.15 to 1 L/min	St.Steel	WA 42
3/8" RH	0.4 to 3 L/min	St.Steel	WA 43
3/8" RH	0.5 to 4 L/min	St.Steel	WA 44
1/2" MH	1 to 8 L/min	St.Steel	WA 46
1/2" MH	1.5 to 12 L/min	St.Steel	WA 47
1" MH	2 to 20 L/min	St.Steel	WA 81
1" MH	4 to 40 L/min	St.Steel	WA 82

Reflux flow transmitters can be ranged to suit higher flowrates than those shown. Please supply details of your application.

Alarms may also be fitted to these meters, please enquire.

For indication only, refer to the LPL Series on page 10.

- Direct Indication with 4 to 20mA Output
- Approved for Explosive Atmospheres
- Fast Response
- High Repeatability
- Customised Calibration
- Low Pressure Drop
- Large Flow Paths
- Site or Factory Configuration Levels



RF 1/2" MH TnA - AI 46

Housing  
3/8" RH  
1/2" MH  
1" MH

Transmitter  
TnA = Standard  
Tia = Intrinsically Safe to: EEx ia IIC T6

Scale Code  
Obtain scale code from the tables above.

If the range you require is not listed, a customised scale can be produced. Please supply: Nominal flow rate or preferred range, fluid properties (e.g. density & viscosity), units, working pressure and temperature.

mm	3/8" RH	1/2" MH	1" MH
a	175	220	220
b	80	125	125
c	56	80	80
d	210	240	275

## Specification

Gas Range	0.5 - 220 L/min (air equiv.)
Liquid Range	75 cm <sup>3</sup> /min - 12 L/min (water equiv.)
Output	2-wire, 4 to 20mA loop powered
Supply	8 to 30 VDC
Approvals	EEx ia IIC T6 ATEX II 2GD T70°C IP65
Accuracy	±2% FSD
Repeatability	±0.5% of Flow
Temperature	-15°C to 60°C
Pressure	20 bar max. (non shock)
Pressure Drop	Gases: 6 mbar max. Liquids: 25 mbar max.
Connections	3/8" or 1/2" BSP Female, Stainless Steel
Seals	Viton
Flow Tube	Borosilicate glass
Float	Stainless steel or Anodised Aluminium (Dural)

# Fluxline Direct Reading Flowmeter

Fluxline



The Fluxline series of flowmeters are suitable for both our glass and acrylic flow tubes.

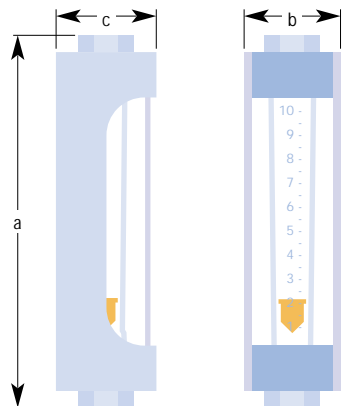
The SAFETY HOUSED (SH) frame, shown here, is used for Glass tubes. An acrylic cover completely surrounds the glass, protecting it from accidental damage and also shielding the user should breakage occur.

FLOWSENSE infra-red flow alarms can be factory mounted or retro-fitted to both Safety Housed and standard Fluxline flowmeters. Details on page 18.

CUSTOMISED SCALES can be provided on request, to meet specific fluid requirements or varied conditions of use.

For fine or ultra-fine control, turn to FINETRIM needle valves on page 19.

- Customised Scales
- High Repeatability
- Safety Version for Glass Flow Tubes
- Panel or Pipe Mounted
- Optional Alarm
- Aesthetic Styling
- Low Pressure Drop



mm	1/2"	3/4"	1"
a	220	250	253
b	45	55	55
c	44	52	52

OF 1/2" 23 S - AI 28

- Housing SH 1/2" = Size 5, 9, 15 or 23 Glass
- OF 1/2" = 23 Plastic
- OF 3/4" = 30
- OF 1" = 30

- Connections S = Stainless Steel
- B = Nickel Plated Brass (1/2" Only)

Obtain Frame Size from the tables on pages 12 & 13.

Scale Code Obtain scale code from tables on pages 12 & 13.

If the range you require is not listed, a customised scale can be produced. Please supply: Nominal flow rate or preferred range, fluid properties (e.g. density & viscosity), units, working pressure and temperature.

## Specification

Gas Range	5 cm <sup>3</sup> /min - 600 L/min (air equiv.)
Liquid Range	2 cm <sup>3</sup> /min - 40 L/min (water equiv.)
Scale Length	100mm or 140mm
Accuracy	2.5 VDI/VDE
Temperature	Glass: -15 to 120°C Acrylic: 60°C max.
Pressure (non shock)	Glass: 10 bar max. Acrylic: 8 bar max. at 20°C 3 bar max. at 60°C
Connections	1/2", 3/4" or 1" BSPF 316 St.Steel 1/2" BSPF Brass
Seals	Sizes 5, 9 & 15: Viton Sizes 23 & 30: Nitrile
Flow Tube	Borosilicate glass or Acrylic
Float	Stainless steel, Anodised aluminium or Acetal

For standard flow ranges refer to tables on pages 12 & 13.

# LPL Series Housed Flowmeter

LPL



LPL Series flowmeters can be used with our glass or acrylic flow tubes. These include Size 40, which combine higher flow rates with a very low pressure drop.

REFLUX 4 TO 20 mA OUTPUT versions of LPL Series flowmeters are available in many standard ranges, many of which are shown on page 6. If the range you require is not shown, please enquire.

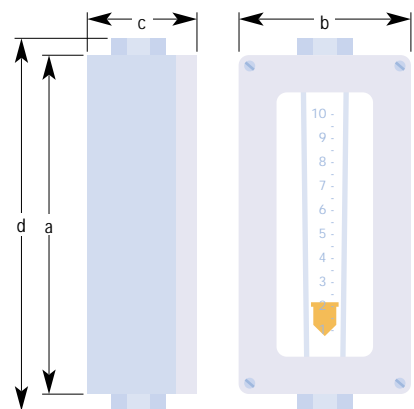
FLOWSENSE infra-red flow alarms can be factory mounted to LPL Series flowmeters. Details on page 18.

CUSTOMISED SCALES can be provided on request, to meet specific fluid requirements or varied conditions of use.

For fine or ultra-fine control, turn to FINETRIM needle valves on page 19.



- Low Pressure Drop
- High Repeatability
- Liquid or Gas Metering
- Customised Calibration
- Panel or Pipe Mounted
- Optional Alarms
- Optional 4 to 20 mA Output
- Rugged Enclosure



LPL 1/2" MH 23 - AI 28

Housing	←	Size	←	Scale Code
3/8" RH	=	5, 9 or 15		Obtain scale code from tables on pages 12 & 13.
1/2" MH	=	23		
1" MH	=	30		
1" LH	=	40		

Obtain Housing Size from the tables on pages 12 & 13.

Please enquire for details of alarm options.

For 4 to 20mA output versions go to page 6.

If the range you require is not listed, a customised scale can be produced. Please supply: Nominal flow rate or preferred range, fluid properties (e.g. density & viscosity), units, working pressure and temperature.

mm	3/8" RH	1/2" MH	1" MH	1" LH
a	175	220	220	355
b	80	125	125	125
c	56	80	80	80
d	210	240	250	410

## Specification

Gas Range	5 cm <sup>3</sup> /min - 2000 L/min (air equiv.)
Liquid Range	2 cm <sup>3</sup> /min - 100 L/min (water equiv.)
Scale Length	100mm, 140mm or 200mm
Accuracy	2.5 VDI/VDE
Temperature	Glass: 120°C, Acrylic: 60°C max.
Pressure (non shock)	Glass: 20 bar max. Acrylic: 8 bar max. at 20°C 3 bar max. at 60°C
Pressure Drop	Gas: 6 mbar max. Liquid: 25 mbar max.
Connections	3/8", 1/2" or 1" BSPF 316 St.Steel
Seals	Sizes 5, 9 & 15: Viton Sizes 23, 30 & 40: Nitrile
Flow Tube	Borosilicate glass or Acrylic
Float	Stainless steel, Anodised aluminium or Acetal
Other Materials	PVC adaptors on 1" units.

For standard flow ranges refer to tables on pages 12 & 13.

## Standard Glass Tubes: for Uniflux (1/4"), LPL (RH) or Fluxline (1/2") Flowmeters

### Selection

Use these tables to choose the flow range best suited to your application.

Once a range has been selected, note the **FRAME SIZE** required and the **SCALE CODE**.

The suitable flowmeter types are listed above each table. Turn to the relevant pages to confirm your choice.

Type	Page
Uniflux	4
Fluxline	8
LPL Series	10

	Air	Argon (Ar)	Butane (C <sub>4</sub> H <sub>10</sub> )	Carbon Dioxide (CO <sub>2</sub> )	Carbon Monoxide (CO)	Cracked Ammonia (N:3H)	Helium (He)	Hydrogen (H <sub>2</sub> )	Methane (CH <sub>4</sub> )	Nitrogen (N <sub>2</sub> )	Oxygen (O <sub>2</sub> )	Propane (C <sub>3</sub> H <sub>8</sub> )	Scale Code	Frame Size	Float Material	Water (H <sub>2</sub> O)	Scale Code	Frame Size	Float Material				
cm <sup>3</sup> /min	5-100	5-80	20-130	10-100	10-100	10-120	5-100	20-250	10-150	5-100	5-90	10-140	02	5	Dural	cm <sup>3</sup> /min	08	5	St.Steel				
	20-250	20-200	50-290	20-250	20-270	30-360	20-280	40-600	40-360	20-250	20-220	40-300	03		Dural					1-10	49	St.Steel	
	60-600	60-560	-	60-600	50-700	-	-	0.2-2.0	-	60-600	40-600	-	38		Dural					4-60	01	St.Steel	
	50-750	40-660	100-800	50-750	50-800	-	50-800	0.1-2.0	0.1-1.1	50-800	50-700	100-850	04		Dural					30-280	02	St.Steel	
	0.1-1.2	0.1-1	0.1-1.1	0.1-1.1	0.1-1.2	0.1-1.8	0.1-1.8	0.2-3.4	0.1-1.7	0.1-1.2	0.1-1.1	0.1-1.2	05		St.Steel					40-480	03	St.Steel	
	0.2-2	0.2-1.7	0.4-2	0.2-1.8	0.2-2	0.3-3	0.2-3	0.4-5.6	0.4-2.8	0.2-2.0	0.2-1.8	0.3-2.2	36		Dural					50-750	04	St.Steel	
	0.3-3	0.2-2.6	-	0.3-2.8	0.3-3	0.2-5.4	0.2-5.6	0.5-10.0	0.4-4.4	0.3-3	0.4-2.8	0.4-3.1	06		Acetal					0.1-1.2	05	St.Steel	
L/min	0.6-5	0.4-4	0.8-4	0.6-4.4	0.6-5	1-8	0.5-9	1.0-15.0	1-7	0.6-5	0.4-4.4	0.8-4.8	07	9	Dural	L/min	06	15	St.Steel				
	1-10	1-8	-	-	-	-	2-20	4-38	-	1-10	-	-	45		St.Steel					0.3-3.0	06	St.Steel	
	1-13	1-11	1-10	1-11	1-12	2-22	1-28	2-46	1-18	1-13	1-12	1-11	08		Dural					0.4-4.4	07	St.Steel	
	2-26	2-22	-	2-20	2-26	4-48	2-60	5-95	2-36	2-27	2-25	2-22	09		St.Steel					WA			
	4-50	4-44	-	4-40	-	10-90	5-120	10-180	5-70	4-50	4-50	4-40	10		Dural								
	10-100	10-90	-	10-80	-	20-180	20-270	40-400	15-140	10-100	10-100	10-85	11		St.Steel								
	20-120	-	-	-	-	-	-	-	-	-	-	-	37		St.Steel								
		AI	AR	BU	CD	CM	CA	HE	HY	ME	NI	OX	PR										

### Compact Glass Tubes: for Uniflux (1/4") Flowmeters

	Air	Scale Code	Frame Size	Float Material	Water (H <sub>2</sub> O)	Scale Code	Frame Size	Float Material
cm <sup>3</sup> /min	20-200	13	5	Dural	10-80	12	5	St.Steel
	50-500	51		Dural	25-250	13		St.Steel
L/min	0.2-1	15	9	Dural	100-700	14	9	St.Steel
	0.5-2.5	52		Dural	L/min 0.2-1.0	15		St.Steel
	0.5-5	53		Dural	WA			
	2-12	18		Dural				
	5-25	54		St.Steel				
	AI							



### Glass Tubes: for LPL (MH) Flowmeters

	Air	Natural Gas	Scale Code	Frame Size	Float Material	Water (H <sub>2</sub> O)	Scale Code	Frame Size	Float Material			
L/min	10-120	-	55	23	Dural	L/min	55	23	St.Steel			
	30-230	-	56		St.Steel							
	40-360	60-480	98	30	Dural					1.5-12	56	St.Steel
	60-600	80-800	99		St.Steel					2-20	98	St.Steel
	AI	NG			WA							

### Acrylic Tubes: for Fluxline (1/2"-1") Flowmeters

	Air	Natural Gas	Scale Code	Frame Size	Float Material	Water (H <sub>2</sub> O)	Scale Code	Frame Size	Float Material			
L/min	10-100	-	28	23	Dural	L/min	28	23	St.Steel			
	30-200	-	29		St.Steel							
	40-360	60-480	30	30	Dural					1-10	29	St.Steel
	60-600	80-800	31		St.Steel					2-20	30	St.Steel
	AI	NG			WA							

### Long Glass Tubes: for Uniflux (1/4") Flowmeters

	Air	Scale Code	Frame Size	Float Material	Water (H <sub>2</sub> O)	Scale Code	Frame Size	Float Material			
L/min	0.05-1.6	24	5	St.Steel	L/min	20	5	St.Steel			
	0.2-4.6	25		Acetal							
	0.5-16	33	9	Dural					2-80	22	St.Steel
	2-36	39		St.Steel					10-350	22	St.Steel
	5-115	27		15					St.Steel	0.05-1.5	24
	AI			WA				15	St.Steel		



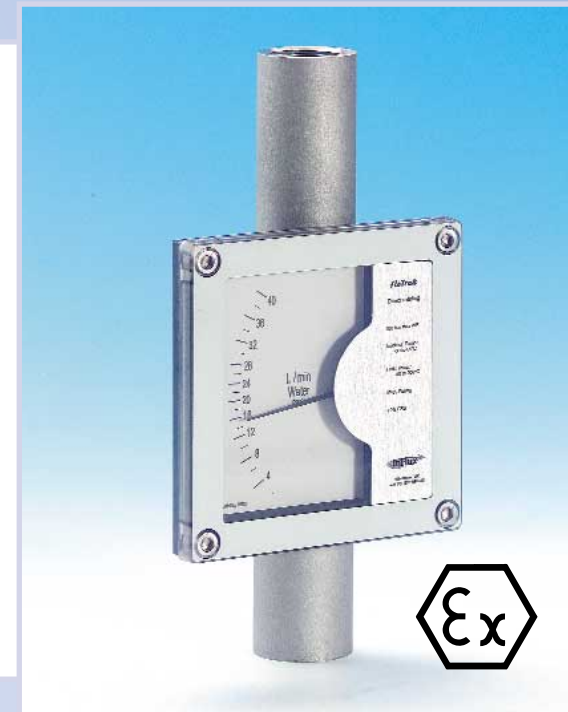
### Acrylic Tubes: for LPL (LH) Flowmeters

	Air	Natural Gas	Scale Code	Frame Size	Float Material	Water (H <sub>2</sub> O)	Scale Code	Frame Size	Float Material
L/min	100-1000	150-1300	57	40	Dural	L/min	57	40	St.Steel
	300-2000	300-2600	58		St.Steel				
	AI	NG			WA				

Size (mm)	Water (20°C)	Scale Code	Air (20°C, 1013 mbar)	Scale Code	Max. Pressure Drop (mbar)
DN 15 Flange or 3/4" BSP	5 to 40 L/h	WA 60	0.1 to 1.2 m³/h	AI 60	40
	5 to 50 L/h	WA 61	0.2 to 1.5 m³/h	AI 61	40
	10 to 70 L/h	WA 62	0.3 to 2 m³/h	AI 62	40
	10 to 100 L/h	WA 63	0.3 to 3 m³/h	AI 63	40
	20 to 160 L/h	WA 64	0.5 to 5 m³/h	AI 64	60
	25 to 250 L/h	WA 65	0.5 to 7 m³/h	AI 65	60
	40 to 400 L/h	WA 66	1 to 11 m³/h	AI 66	60
DN 25 Flange or 1" BSP	60 to 600 L/h	WA 67	2 to 17 m³/h	AI 67	80
	0.1 to 1 m³/h	WA 68	3 to 30 m³/h	AI 68	60
	0.2 to 1.6 m³/h	WA 69	5 to 45 m³/h	AI 69	75
	0.25 to 2.5 m³/h	WA 70	7 to 70 m³/h	AI 70	90
	0.4 to 4 m³/h	WA 71	10 to 110 m³/h	AI 71	100
DN 50 Flange or 2" BSP	0.6 to 6 m³/h	WA 72	-	-	500
	0.4 to 4 m³/h	WA 73	10 to 110 m³/h	AI 73	60
	0.6 to 6 m³/h	WA 74	20 to 170 m³/h	AI 74	70
	1 to 10 m³/h	WA 75	30 to 300 m³/h	AI 75	85
	2 to 16 m³/h	WA 76	50 to 450 m³/h	AI 76	100
	2 to 25 m³/h	WA 77	70 to 700 m³/h	AI 77	130

Other connection types, sizes and materials can be manufactured to your specific requirements.

- Screwed or Flanged Connections
- St. Steel Indicator Housing
- Upgradeable Output Devices
- Independent 4 to 20mA Output
- Hazardous Rating
- Customised Calibration
- High Working Pressures
- Repeatable Performance



FloTrak meters are installed in vertical lines with flow upwards and are normally supported by the pipework.

FTK 15 P D - AI 65

Size  
 15 = DN15 or 3/4"  
 25 = DN25 or 1"  
 50 = DN50 or 2"

Connection Type  
 P = PN 16  
 A = ANSI 150  
 S = BSP Female

Output  
 D = Direct Reading  
 1A = Single Alarm\*  
 2A = Dual Alarm\*  
 TnA = 4 to 20mA  
 Tia = 4 to 20mA EEx ia IIC T6

\*Interface unit required, please enquire.

Scale Code  
 Obtain scale code from table above.  
 If the range you require is not listed, a customised scale can be produced.  
 Please supply:  
 Nominal flow rate or preferred range, fluid properties (e.g. density & viscosity), units, working pressure and temperature.

### Specification

Gas Range	0.1 - 700 m³/h (air equiv.)
Liquid Range	5 L/h - 25 m³/h (water equiv.)
Scale Length	100mm
Alarms*	Single or Dual NAMUR Type (ATEX II 2G)
Transmitter*	2-wire 4 to 20mA (EEx ia IIC T6)
Protection	IP65 (ATEX II 2GD T70°C)
Accuracy	± 2% FSD
Repeatability	0.5% of Flow
Temperature	-30° to +65°C Ambient -40° to +200°C Fluid
Pressure**	100bar max. (or flange rating)
Flanged	DIN PN16 or ANSI 150
Screwed	BSP female
Sizes	DN15-DN50 (3/4" - 2")
Materials	316 SS standard

\*Alarms and transmitter are optional.

\*\*In accordance with the European Pressure Equipment Directive 97/23/EC, stated pressure rating is for Group 2 fluids (non-dangerous).

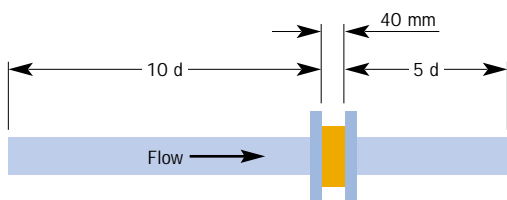
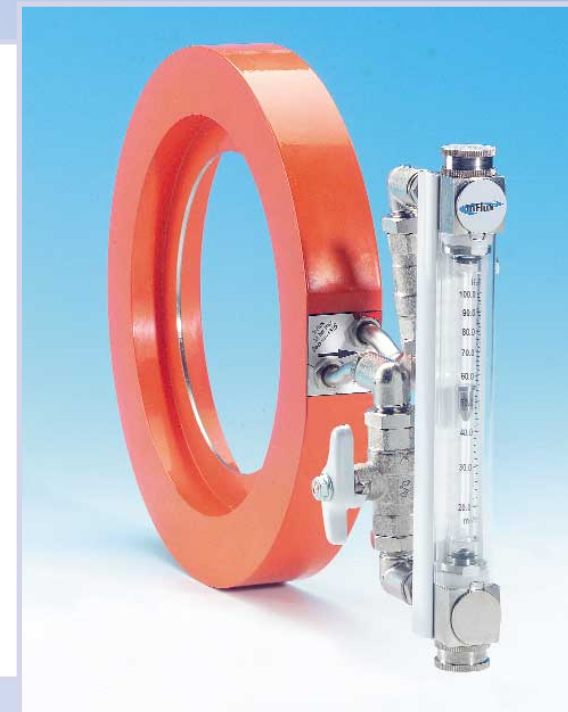
### Flow Ranges (@ 20°C, 1013 mbar)

Pipe Size (mm)	Water m <sup>3</sup> /h	Scale Code	Water m <sup>3</sup> /h	Scale Code	Air m <sup>3</sup> /h	Scale Code
DN 38	2 to 20	WA 85	2 to 10	WA 91	20 to 150	AI 85
DN 50	5 to 40	WA 86	4 to 20	WA 92	40 to 300	AI 86
DN 80	10 to 100	WA 87	10 to 40	WA 93	100 to 700	AI 87
DN 100	20 to 200	WA 88	20 to 100	WA 94	200 to 1500	AI 88
DN 150	50 to 400	WA 89	40 to 200	WA 95	500 to 3500	AI 89
DN 200	100 to 1000	WA 90	80 to 400	WA 96	1000 to 7000	AI 90
400 mbar		100 mbar		40 mbar		
Unrecovered pressure loss at maximum flow						

FLOWSENSE infra-red flow alarms can be factory mounted or retro-fitted. Details on page 18.

Other materials of construction are available, please enquire for details.

- Direct Reading Scale
- Wafer Flange Connections
- Compact Construction
- Vertical or Horizontal Mounting
- Integral Bleed and Drain
- By-Pass Isolation Valves
- Optional Alarm
- High Flow Capacities



DF 100 - AI 88

- Size
- 38 = DN 38
  - 50 = DN 50
  - 80 = DN 80
  - 100 = DN 100
  - 150 = DN 150
  - 200 = DN 200

Scale Code  
Obtain scale code from the tables above.

If the range you require is not listed, a customised scale can be produced. Please supply:  
Nominal flow rate or preferred range, fluid properties (e.g. density & viscosity), units, working pressure and temperature.

Additional sizes are available on request.

The achievable accuracy of the Deltaflux flowmeter is a function of installation. For best results, minimum straight lengths of pipe 10 diameter upstream and 5 diameter downstream are recommended.

### Specification

Gas Range	20 m <sup>3</sup> /h - 7000 m <sup>3</sup> /h (air equiv.)
Liquid Range	2 m <sup>3</sup> /h - 1000 m <sup>3</sup> /h (water equiv.)
Scale Length	100mm
Accuracy	± 2% FSD
Temperature	-15 to 90°C
Pressure*	20 bar max. (non shock)
Connections	Flange wafer, bolted between flanges (DIN or BS10 Table E or D)
Seals	Viton and polyurethane
Flow Tube	Borosilicate glass
Float	Liquids: Stainless steel Gases: Anodised aluminium (Dural)
Orifice Carrier	316 St. Steel flow orifice mounted in a polyester coated carbon steel carrier
Other Materials	Copper and brass

\* Pressure rating for water applications. In accordance with the European Pressure Equipment Directive 97/23/EC, actual pressure rating is dependent upon fluid type and nominal pipe size.

# Flowsense Alarm



- Fits All Frame Types
- Adjusts to Any Point on Scale
- Simple Interfacing
- Selectable Output Modes
- Power Failure Detection
- Can be Retro-Fitted
- Optional Power Supply + Relay Module

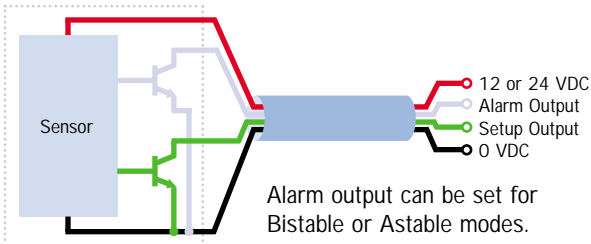
## Sensor

Supply	12 VDC, 30mA (24 VDC optional)
Output	2 x npn open collector* 150mA, 24VDC max.
Cable	3m, screened 4 core
Temperature	-5 to 60°C

\* Alarm output conducts in non-alarm state. Setup output non-conducting after power failure, until initialised.

## Power Supply + Relay Module

Supply	115/230 VAC, 50-60Hz
PSU Output	12 VDC, 200 mA max.
Relays	2 x SPNO 10A @ 30VDC/250VAC 125VDC/380VAC max. 10mA @ 5VDC min.
Indicators	Power on, Output and Setup LED's
Temperature Protection	-5 to 50°C IP65



Sensor: **FIS 12V - Uniflux**

Supply: 12V, 24V  
Flowmeter: Specify type of flowmeter to be used.

Power Supply + Relay Module: **FPSU**

Suitable for up to two 12V sensors.

Depending upon flowmeter type and range required, for Hazardous Area applications, NAMUR type inductive sensors may be available. Enquire for suitability.

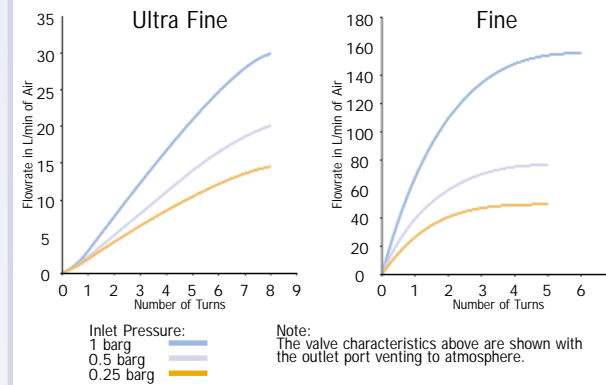
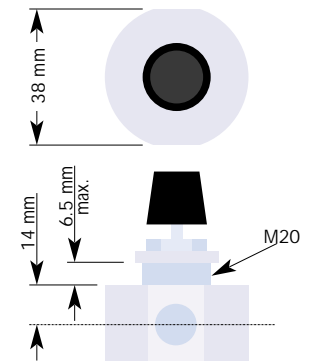
# Finetrim Valves

- Gas or Liquid Control
- Multi-Turn Operation
- Choice of Valve Characteristics
- Stainless Steel Construction
- Interchangeable Valve Cartridge



## Specification

Temperature	120°C max.
Pressure	30 bar max.
Adjustment	10 operating turns maximum
Connections	1/4" BSPP Female
Seals	Viton and PTFE
Valve Body	316 Stainless steel
Valve Needle	316 Stainless steel



**FT V1**

Characteristic: V1 = Ultra Fine (CV 0.04), V2 = Fine (CV 0.4)

## Gas Sizing

For non-standard gases or conditions, use the tables below to find the flowrate of Air @ 20°C and 1013 mbar and match to the equivalent flowmeter type and size.

To convert from Air at other temperatures or pressures, use table 1.

To convert from other gases to Air, use table 2.

Table 1: Multiplier to give equivalent flow @ 20°C and 1013 mbar

Fluid Conditions	0 bar g	1 bar g	2 bar g	3 bar g	4 bar g	5 bar g	6 bar g	7 bar g
0°C	0.965	0.685	0.560	0.485	0.434	0.396	0.367	0.343
10°C	0.983	0.697	0.570	0.494	0.442	0.403	0.374	0.349
20°C	1.000	0.709	0.580	0.502	0.450	0.410	0.380	0.355
30°C	1.017	0.721	0.590	0.511	0.457	0.417	0.387	0.362
40°C	1.034	0.733	0.599	0.519	0.465	0.424	0.393	0.368
50°C	1.050	0.745	0.609	0.528	0.472	0.431	0.399	0.373
60°C	1.066	0.756	0.618	0.536	0.479	0.438	0.405	0.379
70°C	1.082	0.768	0.627	0.544	0.486	0.444	0.411	0.385
80°C	1.098	0.779	0.636	0.552	0.493	0.451	0.417	0.390
90°C	1.113	0.790	0.645	0.559	0.500	0.457	0.423	0.396
100°C	1.128	0.800	0.654	0.567	0.507	0.463	0.429	0.401

Table 2: Multiplier to give equivalent flow of Air

Fluid	Symbol	Multiplier
Acetylene	C <sub>2</sub> H <sub>2</sub>	0.948
Ammonia	NH <sub>3</sub>	0.767
Argon	Ar	1.175
Butane	C <sub>4</sub> H <sub>16</sub>	1.417
Carbon Dioxide	CO <sub>2</sub>	1.233
Carbon Monoxide	CO	0.983
Chlorine	Cl <sub>2</sub>	1.565
Ethane	C <sub>2</sub> H <sub>6</sub>	1.019
Ethylene	C <sub>2</sub> H <sub>4</sub>	0.984
Hydrogen	H <sub>2</sub>	0.264
Hydrogen Chloride	HCl	1.122
Hydrogen Sulphide	H <sub>2</sub> S	1.085
Methane	CH <sub>4</sub>	0.744
Neon	Ne	0.835
Nitrogen	N <sub>2</sub>	0.984
Nitrous Oxide	N <sub>2</sub> O	1.233
Oxygen	O <sub>2</sub>	1.051
Propane	C <sub>3</sub> H <sub>8</sub>	1.234
Sulphur Dioxide	SO <sub>2</sub>	1.487

### Example 1

50 L/min of Air @ 2 barg & 40°C  
 Using table 1:  
 Equivalent flow of Air @ 1013 mbar and 20°C  
 = 50 L/min x 0.599  
 = 30 L/min

### Example 2

50 L/min of Hydrogen @ 1013 mbar & 20°C  
 Using table 2:  
 Equivalent flow of Air @ 1013 mbar and 20°C  
 = 50 L/min x 0.264  
 = 13.2 L/min

### Example 3

50 L/min of Hydrogen @ 2 barg & 40°C  
 Using tables 1 & 2:  
 Equivalent flow of Air @ 1013 mbar and 20°C  
 = 50 L/min x 0.599 x 0.264  
 = 7.9 L/min

## Liquid Sizing

For liquids other than water, use the Specific Gravity (SG) of the liquid and the table below to find the water flowrate and match to the equivalent flowmeter type and size.

Multiplier to give equivalent water flow

Liquid SG (g/cm <sup>3</sup> )	Multiplier
0.7	0.819
0.8	0.882
0.9	0.942
1.0	1.000
1.1	1.056
1.2	1.111
1.3	1.166
1.4	1.218
1.5	1.271
1.6	1.323

### Example

25 L/min of Liquid with a Specific Gravity of 1.2  
 Using the table:  
 Equivalent flow of Water  
 = 25 L/min x 1.111  
 = 27.8 L/min

## Calibration and Accuracy

Calibrations are normally carried out in series on air or water, and accuracies are stated as either % of full scale or VDI/VDE 3513 accuracy class.

Further levels of calibration accuracy, fully traceable or UKAS Certification, can also be applied in most requested cases.

### VDI/VDE 3513 class 2.5

Total tolerance = 1.875% of measured flow + 0.625% of full scale.

### Example

For an actual flow of 70 L/min using a flowmeter with a full scale of 100 L/min  
 Using the equation above:  
 Total tolerance = 1.875% of 70 L/min + 0.625% of 100 L/min  
 = 1.3125 + 0.625 L/min  
 = 1.9375 L/min

The standard material builds available are suited to the most commonly used fluids. The following list shows the recommended material selections for some of the more arduous fluids encountered. Special materials of construction such as PTFE and Hastelloy are available on request.

Fluid	Connections	Float	Seals	Tube or body
Acetic Acid 50%	St.Steel	St.Steel or Dural	Nitrile	Glass or St.Steel
Acetone	St.Steel or Brass	St.Steel or Dural	Viton	Glass or St.Steel
Acetylene	St.Steel	St.Steel or Dural	Viton	Glass, Acrylic or St.Steel
Ammonia Anhydrous	St.Steel	St.Steel or Dural	Nitrile	Glass or St.Steel
Ammonia Dry Gas	St.Steel	St.Steel or Dural	Nitrile	Glass or St.Steel
Ammonia Liquid	St.Steel	St.Steel	PTFE	Glass or St.Steel
Ammonium Nitrate	St.Steel	St.Steel	Nitrile	Glass or St.Steel
Butane	St.Steel	St.Steel or Dural	Viton	Glass, Acrylic or St.Steel
Butylene	St.Steel	St.Steel	Viton	Glass or St.Steel
Calcium Chloride	St.Steel	St.Steel	Viton	Glass or St.Steel
Chlorine Dry	St.Steel	St.Steel	PTFE	Glass or St.Steel
Diesel Fuel	St.Steel or Brass	St.Steel	Viton	Glass or St.Steel
R134a	St.Steel	St.Steel	Nitrile	Glass or St.Steel
Hydrogen	St.Steel or Brass	St.Steel or Dural	Viton	Glass, Acrylic or St.Steel
Hydrogen Sulphide (Aq)	St.Steel	St.Steel	PTFE	Glass or St.Steel
Hydrogen Sulphide Dry	St.Steel	St.Steel or Dural	Viton	Glass or St.Steel
Kerosene	St.Steel or Brass	St.Steel	Viton	Glass or St.Steel
Methanol	St.Steel or Brass	St.Steel	Nitrile	Glass or St.Steel
Methyl Chloride	St.Steel or Brass	St.Steel	PTFE	Glass or St.Steel
Nitric Acid 10%	St.Steel	St.Steel	Viton	Glass or St.Steel
Oxygen Gas	Brass	St.Steel or Dural	Viton	Glass, Acrylic or St.Steel
Ozone	St.Steel	St.Steel or Dural	Viton	Glass or St.Steel
Phosphoric Acid	St.Steel	St.Steel	Viton	Glass or St.Steel
Sodium Hydroxide 20%	St.Steel	St.Steel	Nitrile	Glass or St.Steel
Sulphur Dioxide	St.Steel	St.Steel	PTFE	Glass or St.Steel
Sulphur Dioxide Dry	St.Steel	St.Steel or Dural	Viton	Glass or St.Steel

Conversion factors for common engineering units.

## Flowrate

Multiply to Convert	To				
	From	cm <sup>3</sup> /min	L/min	L/h	m <sup>3</sup> /h
cm <sup>3</sup> /sec		60	0.06	3.6	0.0036
cm <sup>3</sup> /min		1	0.001	0.06	0.00006
L/min		1000	1	60	0.06
L/h		16.67	0.0166	1	0.001
m <sup>3</sup> /h		16670	16.67	1000	1
CFM		28320	28.32	1699.2	1.6992
CFH		471.9	0.4719	28.32	0.02832
Imp GPM		454.6	4.546	272.76	0.27276
Imp GPH		75.77	0.07577	4.546	0.004546
US GPM		3785	3.785	227.1	0.2271
US GPH		63.08	0.06308	3.785	0.003785

## Pressure

Multiply to Convert	To	
	From	To
	mbar	bar
psi	68.947	0.069
atms.	1013	1.013
inch H <sub>2</sub> O	2.486	0.0025
Kg/cm <sup>2</sup>	980.662	0.981
mm H <sub>2</sub> O	0.0977	0.000098
mm Hg	1.329	0.001329
kPa	10	0.01

## Temperature

To Convert	To
	From
°F	°C
	$\frac{(^{\circ}\text{F} - 32)}{1.8}$
K	K - 273.15

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