

## Glass Variable Area Flowmeters

### FLOWMETERS LGX/NGX

- Improved industrialised construction
- Easy to use, high visibility scale
- Rear 'blow out' safety vent
- Ergonomic design
- UV stabilised rigid safety cover
- Gas or liquid flow measurement
- Operator confidence from float rotation
- Instantaneous response
- Accuracy up to  $\pm 1.25\%$  FSD
- Air flow range 5mL/min to 150 L/min
- Customised scales
- Glass tube removal without tools
- ATEX Infra-red alarm option
- Range of accessories
- UKAS calibration optional
- Available from stock
- Next day delivery (subject to specification)
- After sales service and repair

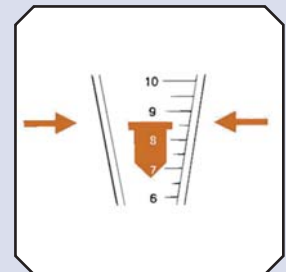


### ENGINEERED TO FIT

- Standard or custom scaled glass tubes to suit process fluids and conditions
- Range of process connections to fit pipe-work requirements
- Brass or stainless steel end blocks with optional integral flow control valve
- Supplied with studs for surface panel mounting

### ACCURATE MEASUREMENT

Flow up the tapered tube lifts the float to an equilibrium position. Flow rate is then measured against the flat top edge of the float.



### FLOWMETER CHOICE

A complete VA flowmeter consists of a glass flow tube and float scaled to the flow units required, and a frame to provide the end block supports and to cover and protect the tube. The NGX Series frames use flow tubes with nominally 100mm long scales, whereas the smaller LGX frames use flow tubes with nominally 30mm scales.

To choose a complete flowmeter select the frame code required, and separately specify the fluid flow range needed on the flow tube scale.

NGX and LGX Series frames are designed to fit your process. The options available allow easy installation, usually surface mounted on a vertical panel. Process connections and labelling can be customised to suit the application.

## SPECIFICATION – FRAMES

<b>Backplate</b>	White polyester powder coated aluminium
<b>End Blocks</b>	Suffix B – Bright nickel plated brass Suffix S – Stainless steel
<b>Seals</b>	Nitrile on brass units Viton on stainless steel units Alternative seals available
<b>Cover</b>	Clip on clear UV stabilised rigid polycarbonate (required to locate flow tube into end blocks)
<b>Connections</b>	Models available with in-line or rear facing process connections (See page 3).
<b>Max. Temp</b>	100°C with viton seals 80°C with nitrile seals
<b>Max. Pressure</b>	Recommended maximum operating in non-shock applications: 16 bar
<b>Valve Option</b>	Fine control valve option has needle valve fitted on flowmeter inlet.
<b>Mounting Stud</b>	M5 studs 13mm long c/w nut

## SPECIFICATION – FLOWTUBES

<b>Flowtube</b>	Borosilicate glass, precision moulded in three diameters to suit flow range
<b>Scale</b>	Fused ceramic black ink
<b>Scale Length</b>	NGX Series – 100mm nominal LGX Series – 30mm nominal
<b>Float</b>	Precision machined float, rotates to give flow visualisation Model HD: Hollow Dural, red anodised Model HS: Hollow Stainless Steel Model SS: Solid Stainless Steel
<b>Accuracy</b>	±1.25% FSD standard for NGX Series (±2.5% for 1CHD/BHD models, ±3% for predicted scales) ±5% FSD for LGX Series
<b>Calibration</b>	All tubes are flow tested. Standard scales are for air & water, as listed. Custom scales to suit process fluid



NGXV

## NGX FLOW RANGES – 100mm Scale

\* - Suffix letter defines standard scale markings. Tubes can be custom scaled for the required fluids and line pressure/temperature conditions (See correction factors on page 4).

Model (for gases)	Air @ ATP (1.013 bar abs. & 20°C)		Frame Size
	Suffix-B	Suffix-D	
GTF1CHD-*	5-100cm <sup>3</sup> /min	-	1
GTF1BHD-*	50-250 cm <sup>3</sup> /min	-	1
GTF1AHD-*	60-600 cm <sup>3</sup> /min	2-40 L/hr	1
GTF1AHS-*	0.1-1.2 L/min	5-70 L/hr	1
GTF2CHD-*	0.2-2 L/min	10-120 L/hr	2
GTF2BHD-*	0.6-5 L/min	30-300 L/hr	2
GTF2BHS-*	1-10 L/min	-	2
GTF2AHD-*	1-12 L/min	50-700 L/hr	2
GTF2AHS-*	2-25 L/min	0.1-1.5 m <sup>3</sup> /hr	2
GTF3AHD-*	6-50 L/min	0.3-3 m <sup>3</sup> /hr	3
GTF3AHS-*	10-100 L/min	0.6-6 m <sup>3</sup> /hr	3
GTF3ASS-*	30-150 L/min	-	3

Model (for liquids)	Water @ 20°C		Frame Size
	Suffix-C	Suffix-E	
GTF1AHS-*	2-25 cm <sup>3</sup> /min	-	1
GTF1ASS-*	10-80 cm <sup>3</sup> /min	0.6-4.6 L/hr	1
GTF2BHS-*	20-280 cm <sup>3</sup> /min	1-16 L/hr	2
GTF2AHS-*	50-800 cm <sup>3</sup> /min	2-46 L/hr	2
GTF2ASS-*	0.2-1.5 L/min	10-90 L/hr	2
GTF3AHS-*	0.2-3.0 L/min	10-180 L/hr	3
GTF3ASS-*	0.4-4.4 L/min	20-270 L/hr	3

## LGX FLOW RANGES – 30mm Scale

Tubes can be custom scaled for the required fluids and line pressure/temperature conditions.

Model (for gases)	Air @ ATP (1.013 bar abs. & 20°C)		Frame Size
RGTF 1 CHD-A	5-100 cm <sup>3</sup> /min	1	
RGTF 1 BHD-A	50-250 cm <sup>3</sup> /min	1	
RGTF 1 AHD-A	50-500 cm <sup>3</sup> /min	1	
RGTF 1 AHS-A	100-1000 cm <sup>3</sup> /min	1	
RGTF 2 CHD-A	0.5-2.5 L/min	2	
RGTF 2 BHD-A	0.5-5 L/min	2	
RGTF 2 AHD-A	2-10 L/min	2	
RGTF 2 AHS-A	5-25 L/min	2	

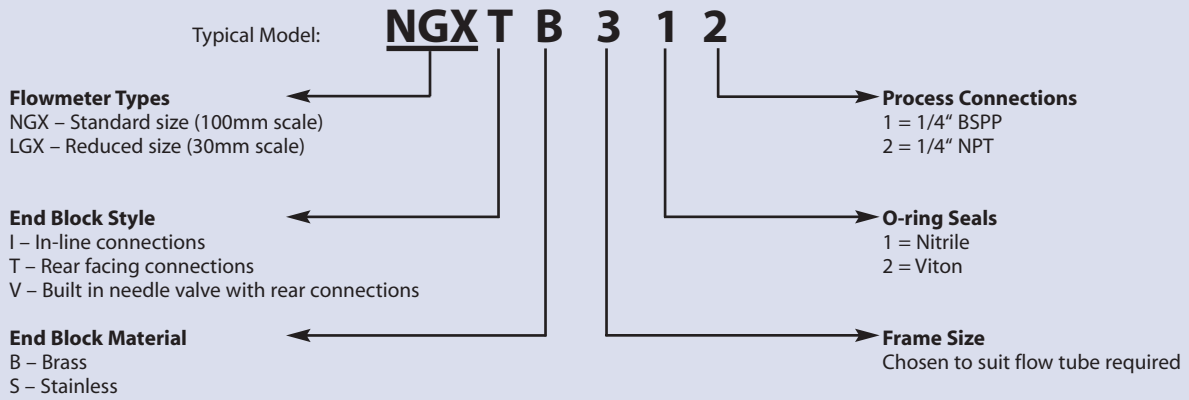
  

Model (for liquids)	Water at 20°C		Frame Size
RGTF 1 ASS-C	1-5 L/hr	1	
RGTF 2 BHS-C	5-15 L/hr	1	
RGTF 2 AHS-C	5-40 L/hr	2	



LGXV

## STANDARD FRAME CODES



## EXTERNAL CONNECTIONS

### Process Connections:

Standard 1/4" BSPP  
 or 1/4" NPT, 20mm OD

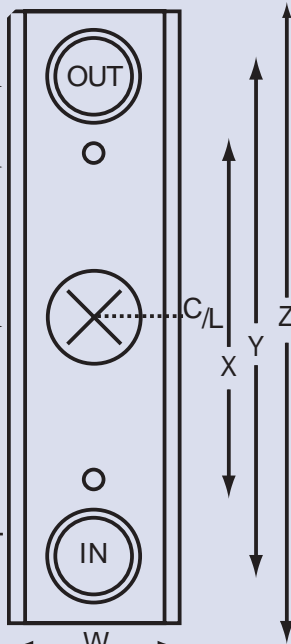
### Mounting Stud:

M5 threaded with nut to  
 locate meter on vertical  
 panel

### Safety Vent:

Allows rear discharge  
 of process fluid in event  
 of glass tube breakage.  
 Dia 20mm

Dims	NGX	LGX
W	30mm	30mm
X	121mm	65mm
Y	184mm	108mm
Z	210mm	134mm



## CUSTOM BUILD

Construction of the NGX and LGX series frames makes custom build or special process connections easily achievable, whether for rear facing or mixed rear/in-line fittings.

Specific custom logos can be printed on the glass tubes and polycarbonate covers if required to suit the application.

## ACCESSORIES

Roxspur Measurement and Control manufacture a range of accessories for use with NGX and LGX Flowmeter. Infrared optical alarm modules can be fitted to the flowmeter frame, giving a high or low rate alarm output directly from the DC powered module. A separate mains supply unit and slave relay alarm output is available.

The bench stand can be used to support a free standing flowmeter, type NGX or LGX, particularly for Laboratory or portable use with nozzle connection if required.

The flush mounting bezel is available for either valved or non-valved NGX series units, allowing the flowmeter to be mounted behind a Makrolon window in a control panel.

Additional connectors, flow control valves and automatic flow controllers can be supplied to allow fine flow rate adjustment and maintain gas or liquid flow despite line pressure changes, particularly useful for blending or analysis applications.

For further information, please ask for the separate data sheets.

**NGXV with alarm sensor (GIR)  
 and bench stand**



## HAZARDOUS FLUIDS

The rear blowout vent and polycarbonate cover on NGX and LGX flowmeters offer a measure of operator protection from glass tube rupture or process leakage. However, for increased operator protection or use on exposed plant pipework, Model GU safety housings should be used with glass tube meters. Alternatively, type API or GMT metal tube meters provide the highest security and integrity.

NGX and LGX flowmeters are not recommended for hydrochloric acid or chlorine because of corrosion of the end blocks. Similarly, sulphuric acid below 80% attacks stainless steel. Borosilicate glass is attacked by fluorine and most of its compounds and high concentrations of caustic soda.

Flowmeters constructed from PTFE or plastic materials are available and can be used for some of these chemicals. Ammonia attacks brass, but can be used with stainless steel end blocks and nitrile O-ring seals.

The VA flowmeter principle is suitable for transparent liquids and some slurries: should the float become stuck in the tube this is visible, and the flow blockage will cause the float to rise. For further application advice, please contact the Sales office.

## SCALES

Please contact the Sales office for help with your particular application or use the tables below which contain some of the common standard flow scales that we provide.

### GLASS SCALES

Flow scales on VA glass tubes are normally expressed in volume flow rate of gas referred to ATP (1.013 bar abs. & 20°C). The standard scales for air are calibrated for process conditions in the flowmeter measuring tube also at 1.013 bar abs. & 20°C. If the process/temperature is different, or the gas involved is not air, then a new scale can be computer predicted and fired onto the tube. Roxspur Measurement and Control specialises in producing scales custom labelled for the site conditions and gas mixtures to be measured. The tabulation shows some of the tubes available as standard for different gases, measured at ATP process conditions.

Gas	Tube and Float code: FGTF-	Flow Ranges For Standard 100mm Scale GTF Tube (L/min at 1.013 bar abs. & 20°C)										Code/Suffix
		1CHD	1BHD	1AHD	1AHS	2CHD	2BHD	2AHD	2AHS	3AHD	3AHS	
Air	5-100*	20-250*	60-600*	0.1-1.2	0.2-2.0	0.6-5.0	1-12	2-25	6-50	10-100	B	
Acetylene	10-150*	30-350*	50-900*	0.1-1.5	0.3-2.5	0.8-5.8	1-14	2-28	6-54	10-110	F	
Argon	5-80*	20-200*	60-560*	0.1-1	0.2-1.7	0.6-4	1-10	2-22	4-40	10-85	J	
Butane	20-120*	50-290*	100-700*	0.1-1.1	0.4-2	0.8-4	1-10	2-18	4-36	10-75	M	
Carbon Dioxide	10-100*	30-250*	50-700*	0.1-1	0.2-1.8	0.8-4.4	1-10	2-20	4-40	10-80	R	
Carbon Monoxide	10-100*	20-250*	50-700*	0.1-1.2	0.2-2	0.6-5	1-12	2-26	4-50	10-100	G	
Cracked Ammonia	10-120*	30-360*	0.1-1.1	0.1-1.8	0.3-3	1-8	2-22	2-48	10-90	20-180	K	
Helium	10-100*	20-250*	50-800*	0.1-1.8	0.2-3	0.5-9	2-28	4-60	10-120	20-270	N	
Hydrogen	20-250*	50-600*	0.2-2	0.2-3.4	0.4-5	1-15	2-44	5-95	10-180	40-380	S	
Methane	10-150*	40-360*	0.05-1	0.1-1.7	0.4-2.8	1-7	1-18	2-36	10-65	15-140	H	
Nitrogen	5-100*	20-250*	60-600*	0.1-1.2	0.2-2	0.6-5	1-12	2-25	6-50	10-100	L	
Oxygen	5-90*	20-220*	40-600*	0.1-1.1	0.2-1.8	0.6-4.4	1-12	1-25	4-48	10-100	P	
Propane	30-140*	40-300*	100-750*	0.1-1.2	0.3-2.2	0.8-4.8	1-11	2-22	4-40	10-85	T	

\*cm<sup>3</sup>/min at ATP

An approximate guide to the effect of non standard process conditions is shown below. The tabulation gives the multiplying factor to be used on any gas flow scale reading resulting from process temperatures or pressures at the measurement tube different to the ATP values.

Gauge Pressure (bar)	0	1	2	4	6	7
0°C	1.036	1.460	1.786	2.304	2.725	2.915
20°C	1.0 (ATP)	1.410	1.724	2.222	2.632	2.817
40°C	0.967	1.364	1.670	2.151	2.544	2.717

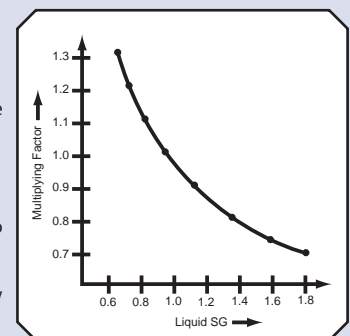
### LIQUID SCALES

The scaling of liquid VA flowmeters is affected by the density and viscosity of the flowing liquid. As a guide, the maximum viscosity measurable on glass VA meters is typically:

**Size 1** 6cP (SS)      **Size 2** 12cP (HS)      20cP (SS)      **Size 3** 20cP (HS)      36cP (SS)

For liquids with viscosity below the figure, the flow tube FSD can be estimated using the graph below, according to the density of the liquid.

The multiplying factor to be used on the water flow tube scale is plotted against liquid SG: this gives the volume flow rate of the liquid when monitored with that tube and float, which can be custom scaled appropriately.



Every effort has been made during the preparation of this document to ensure the accuracy of statements and specifications. However, we do not accept liability for damage, injury, loss or expense caused by errors or omissions made. We reserve the right to withdraw or amend products or documentation without notice.

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