

DX-DL

Description

The Exact dual rotor turbine flowmeter provides extended range performance—not obtainable by traditional single rotor designs. The extra flow range capability often eliminates the need for manifold systems, which simplifies installation and lowers cost. The exceptional performance, provided by the dual rotor, enhances UVC curves and extends the usable measurement flow range. Flow straighteners are not required to control process fluid swirl, as the unique dual rotor system cancels out rotor acceleration effect. With flow straighteners, bearing diagnostics can be determined by monitoring the ratio of the rotors to detect wear or cleanliness. Exact also offers a unique pickoff system that is impervious to vibration and minimizes space, allowing for direct coupling of electronics. Both integral and remote electronics are available to process the signal output, including the Exact Comp EC15 flow computer.



FM78587
AS9100 Rev. B and
ISO 9001:2000



Exact DX

Flow Computer shown with explosion proof/NEMA 4 housing



Exact DL

MS connector for remote Flow Computer

Benefits

- Superior absolute accuracy $\pm 0.10\%$ of reading
- NVLAP calibration uncertainty $\leq 0.05\%$
- Repeatability of 0.02%
- Provides 2–6 times wider operating flow ranges
- Extends UVC flow range
- Integral pickoffs are impervious to vibration
- Flow Straighteners are not required, reducing installation space
- Right angle piping bends do not affect flow measurement
- Bearing diagnostics are achievable with flow straighteners
- OEM rapid development custom designs

Features

- Helical rotors to enhance performance
- High shock design standard
- Dual bearing systems for all fluids, including water
- Static line pressure 3000 psig standard (30,000 psig optional)
- End fittings include AN, NPT, Flange and specials

Applications

- OEM flight and industrial applications
- Engine test cells and test stands
- Precision flow monitoring
- On-board automotive and aerospace testing
- Custody transfer
- Correlation Standards
- Flow Transfer Standard Master Meter

DX-DL

Calibrations

Calibrations are performed at Flow Dynamics, Inc., in a NVLAP accredited facility, obtaining uncertainties of $\leq 0.05\%$ of rate and $\pm 0.012\%$ repeatability. Calibrations are offered in 1.2 cSt solvent, blended oils and water with 10, 20 or 30 calibration data points. Universal Viscosity Curves (UVC) are developed over the min/max temperature range of your fluid. Data is presented in Strouhal–Roshko format. Calibration data is obtained from both rotors and can be summed for use in a compatible flow computer such as the Exact Comp EC15.

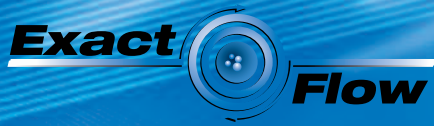


Flow Dynamics calibration laboratory



Sizing and Range

Model #	End Fitting	Flow Ranges @ 1 cStk, S.G. = 1		Turn-down range 1 cStk	UVC Turn-down range	Typical K Factor Pulses/Gallon	
		GPM	LPM			Ratio	Ratio
DX/DL8-4	1/4" NPT / 1/2" AN	0.025 – 3.0	0.095 – 11.4	120:1	30:1	30000	33000
DX/DL8-6	3/8" NPT / 1/2" AN	0.035 – 6.0	0.132 – 22.7	171:1	35:1	15000	16500
DX/DL-08	1/2"	0.040 – 10	0.132 – 37.8	286:1	40:1	9480	10440
DX/DL-10	3/4" NPT / 5/8" AN	0.045 – 16	0.170 – 60.5	355:1	45:1	6000	6375
DX/DL-12	3/4"	0.08 – 30	0.189 – 113.5	375:1	50:1	3640	4000
DX/DL-16	1"	0.15 – 65	0.378 – 246	433:1	60:1	1680	1846
DX/DL-20	1 1/4"	0.25 – 95	0.946 – 359.6	380:1	60:1	1149	1263
DX/DL-24	1 1/2"	0.35 – 155	1.324 – 586.7	443:1	60:1	705	774
DX/DL-32	2"	0.60 – 310	1.70 – 1173.4	517:1	60:1	242	266
DX/DL-40	2 1/2"	1.0 – 500	3.78 – 1892.7	500:1	60:1	132	145
DX/DL-48	3"	2.0 – 800	7.57 – 3028	400:1	60:1	45	50
DX/DL-64	4"	5 – 1,500	18.9 – 5678	300:1	60:1	20	22



$$St = fD / V = KD^3 = K (D_o [1+a(T-T_o)])^3$$

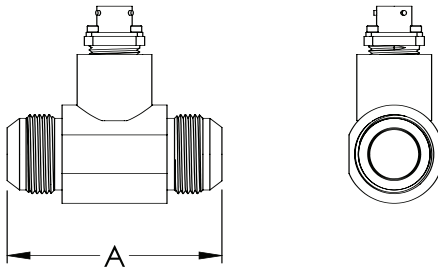
$$Ro = Re * St = VD/v * fD/V = fD^2/v$$

Dimensions

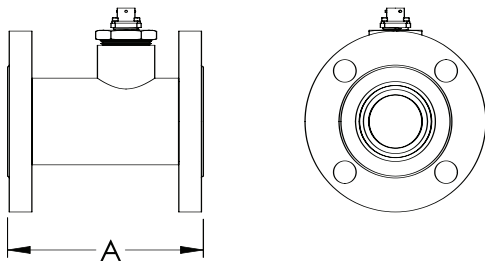
Dual Rotor Housing Dimensions - inches (mm)

Model #	Size	"A" FLANGE	"A" AN/NPT
DX/DL8-4	1/4" NPT / 1/2" AN		2.75 (70)
DX/DL8-6	3/8" NPT / 1/2" AN		2.75 (70)
DX/DL-08	1/2"		2.75 (70)
DX/DL-10	5/8"		2.92 (74)
DX/DL-12	3/4"		3.25 (83)
DX/DL-16	1"	5.50 (140)	3.56 (91)
DX/DL-20	1 1/4"	6.00 (152)	4.06 (103)
DX/DL-24	1 1/2"	6.00 (152)	4.59 (117)
DX/DL-32	2"	6.50 (165)	6.06 (154)
DX/DL-40	2 1/2"	7.00 (178)	N/A
DX/DL-48	3"	10.0 (254)	N/A
DX/DL-64	4"	12.0 (305)	N/A

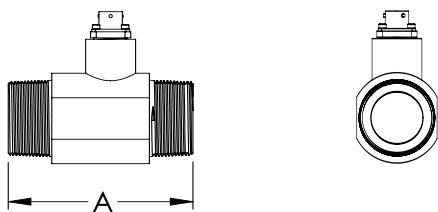
AN Series



FLG Series



NPT Series



MS Connector
Remote Flow
Computer



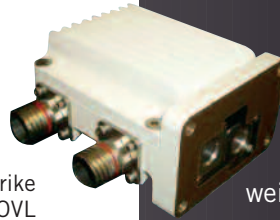
Explosion Proof/
NEMA 4
Flow Computer

Standard Design

The Exact dual rotor design extends the lower flow range far below the traditional single rotor designs by overcoming the drag and torsional forces on the rotor. The dual rotors become hydraulically coupled, due to their counter-rotational direction. The angular flow path on the second rotor overcomes the inertia, due to its perpendicular force on the helical blades. Flow measurement range capability is greatly extended and UVC plots blend over a wider usable flow range.

Aerospace Design

Exact Flow delivers a diverse range of integrated flow, temperature and pressure sensor systems in light weight compact packaging. These unique flowmeter systems provide accuracies of 0.25% of reading while providing extended range performance and superior Universal Viscosity Curve flow ranges of up to 60:1 turndown.



Joint Strike
Fighter STOVL
Flight Certified



Small Business
Jets, Light
weight with
Integrated Flow
Computer



X51 Scram Jet
Main Fuel
Flowmeter
Integrated
Flow Computer

From UAVs to scram jet military space missiles, our integrated product solutions touch virtually every type of new aerospace platform in development today.

DX-DL

Model Number



Model

DL – Dual Rotor, MS Connector
DX – Dual Rotor Explosion Proof
 NEMA 4

Nominal Bore Size

8-4	1/4"	-20	1 1/4"
8-6	3/8"	-24	1 1/2"
-08	1/2"	-32	2"
-10	5/8"	-40	2 1/2"
-12	3/4"	-48	3"
-16	1"	-64	4"

End Fitting

AN	37° Flare (AS4395)
NP	NPT Pipe Thread
F1	150# RF Flange Temp.
F2	300# RF Flange
F3	600# RF Flange
F4	900# RF Flange
F5	1500# RF Flange
HB	Hose Barb

Special Option

XXX = 3-digit option code

Pickoff

A	RF Carrier
B	RF Carrier with Thermister
R	RF Carrier with RTD

Bearing

4	440C (Std.)
P	Cryo Application
W	Hybrid Ceramic Ball Bearings Water Service
C	Hybrid Ceramic Ball Bearings Hydrocarbon Service

Specifications *(Note: specifications are subject to change and performance may vary depending on application)*

Performance:

- Repeatability:** ± 0.02% Standard
- Linearity:** ± 0.1% of reading over the entire repeatable range using EC15 Flow Computer
- Calibration Uncertainty:** ≤ 0.05% of reading, 0.012% repeatability
- Process Temperature:** -450°F (-270°C) to 300°F (150°C) standard
- Operating Pressure:** Up to 30,000 PSIG depending on size and end connection
- Pressure Drop:** 14 PSID at max. flow rate @ 1.2 cSt

Material of construction: (Other materials optional)

Body: 316 SST	Supports: 303 SST
Shafts: 316 SST	Transitions: 303 SST
Rotors: 17-4 PH SST	
Nuts: ASTM A286	
Spacers: 303 SS	

Dual Frequency Outputs: See EC15 Flow Computer specifications for output selections.

Filtration: 10 micron recommended (larger meters require less filtration 50 micron max.)

Representative

Exact Flow Dual Rotor Flowmeter
Distributor: ThermX Southwest 800-284-3769
www.thermx.com



Call Exact Flow for application assistance and proper system configuration.