

FIOW N MFTF G F RI UIPMENT Ω

Model AR Ellipse[®] **Annular Flow Meter**

Preso's patented elliptical design outperforms and provides greater accuracy than traditional differential pressure flow measurement devices. This differential pressure flow meter is designed with a series of ports facing the upstream velocity pressures, as well as flow sensing ports strategically located ahead of the trailing edge flow separation.

Features

- Patented elliptical design outperforms traditional devices
- Single point pipe entry for DP, temperature and static pressure
- No dampening software required
- Lowest pressure loss in industry (typically 3% of DP in a 12" line) due to its patented aerodynamic profile
- NIST traceable calibration: Optional independent labs

Benefits

- Accuracy: ±0.75% of reading, repeatability: ±0.1% of reading
- Turndown Ratio: 17:1: no vacuum effects
- No moving parts equals long, trouble-free service life
- True static pressure measurement rather than a calculated value
- Overcomes loss of accuracy caused by fluid separation at the sensor body

The multi-ported, self averaging flow element consists of an elliptical shape with two independent flow sensing chambers. The impact velocity sensing holes (high pressure) are located along the leading edge and the true static sensing holes (low pressure) are on the exterior probe side. Model AR comes with instrument shut-off valves with provisions to accept a True static transmitter or direct sensing holes indicating meter.

> Impact velocity sensing holes

1-800-632-7337

Specifications

Applications: Liquids and Gases **Pipe Sizes:** 2 to 72 inches (50 to 1830 mm) Pressure: 800 PSI (5515 kPa) max. **Temperature:** 800 °F (426 °C) max. ± 0.75% of reading Accuracy: Standard Components: **Revnolds** Number:

Resonance:

Turndown Ratio: 17:1 with no vacuum effect T-type head, 316 SS 1/4" or 1/2" FNPT connection CS compression fitting with SS ferrule CS 3000 lb. weld fitting - ASTM A105

316/316L SS Ellipse sensor Instrument valves (2 per sensor) - 1/4", CS 316 SS ID tag with wire

Greater than 75,000 maintains most accurate flow measurements Less than 75,000 consult factory for estimated results If greater than 0.8, use double support

Model AR Ellipse[®] Annular Flow Meter

Part Number Construction: PARO (1/2") PAR (7/8") PAR1 (1-1/4")

ipe Size PAR/PAR0)	Pipe Size (PAR1)	Sched A) Std	ule J) 160	Pipe Orientation A) Horizontal B) Vertical	Instrume (PAR/PA A) 1/2" N	ent Connection R1) NPT		(I	nstrumen PAR/PAR	t Valve* 1)
2 inch	A) 12 inch	B) 20	K) XH	D , Vertiedi	B) 1/2" S	Socket		F	1/2 No	
2-1/2 inch	B) 14 inch	C) 30	L) XXH	Probe Material -	C) TT3 (I	ntegral 3 Valve			Notroa	uirod
3 inch	C) 16 inch	D) 40	M) 5S	1) 316/316L-SS	Trans	-Mount)		2	., Notreq	
, 3-1/2 inch	D) 18 inch	E) 60	N) 10S	2) Monel	D) TT5 (1	ntegral 5 Valve		1	nstrumen	t Valve*
4 inch	E) 20 inch	F) 80	O) 40S	2) Inconel [®]	Trans	-Mount)		(PAR0)	
5 inch	F) 24 inch	G) 100	P) 80S	4) Hastollov®	E) Trans	mitter Flange		A	A) 1/4" Ne	edle CS
6 inch	G) 30 inch	H) 120		Y) Other (concult	Conne	ection		E	3) 1/4" Ne	edle SS
8 inch	H) 36 inch	I) 140		factory to revie		ant Connection		Z) Not req	uired
10 inch	1) 42 inch			application)		ant connection		*	NOTE: Tra	nsmitter
12 inch	J) 48 inch			application	(PARU)	IDT		F	lange Con	nection
14 inch	K) 60 inch				A) 1/4 N	IPI		Ċ	Options ava	ailable
16 inch	L) 72 inch		Conn	ection (PAR/PAR1) -				v	vhen Optic	on E under
)18 inch			A) C3	S Compression	Pi	pe Mounting –		!i	nstrument	Connectio
20 inch	NOTE	1	Fi	tting w/SS Ferrule	1)	A105 CS 3000#		is £	s selected.	. (consult
24 inch	PARO installe		B) SS	S Compression	2)	316/316L SS 1	50#	Ta	actory for I	mornation
30 inch	on nine sizes 2		Fi	tting w/SS Ferrule	3)	316/316L SS 30	000#			
36 inch	through 5" only	/	0		4)	A105 CS 3000#		RTD -		_
	(A through F		Conr		.,	w/Dbl Support		1) 100 C	Dhm RTD	3 wire
	options)		A) 53	5 Compression		(see below)		w/E>	plosion P	roof Head
			Fi	tting w/SS Ferule	5) 6)	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support	50# 000#	 2) 100 0 w/Alu Z) Not r 	Dhm RTD : uminum H equired	3 wire, Inte lead
		_		Itting w/SS Ferule	5) 6)	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support	50# 000# Allowable	 2) 100 C w/Alu Z) Not r DP (Inchesting) 	Dhm RTD : Iminum H equired es of Water	3 wire, Inte lead r Column) Support
Dime	nsions (inche	_ s)			5) 6) 	316/316L SS 15 w/Dbl Support 316/316L SS 33 w/Dbl Support	50# 000# Allowable Single S Probe	2) 100 C w/Alu Z) Not r DP (Inche upport Size	Dhm RTD : Iminum H equired es of Water Double S Probe	3 wire, Inte lead r Column) Support e Size
Dime	nsions (inche	es)	Fr		5) 6) 	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Maximum Pipe Size (inches)	50# DOO# Allowable Single S Probe 7/8	2) 100 (w/Alu Z) Not r DP (Inche upport Size 1-1/4	Dhm RTD : Iminum H equired es of Water Double S Probe 7/8	3 wire, Inte lead r Column) Support size 1-1/4
Dime	nsions (inche Probe Length	es)			5) 6) 	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Maximum Pipe Size (inches) 2	50# D00# Allowable Single S Probe 7/8 880	2) 100 (w/Alu Z) Not r DP (Inche upport Size 1-1/4 —	Dhm RTD : Iminum H equired es of Water Probe 7/8 2380	3 wire, Inte lead r Column) Support size 1-1/4 —
Dime	nsions (inche Probe Length A	es)			5) 6) 	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Maximum Pipe Size (inches) 2 2-1/2	50# 000# Allowable Single S Probe 7/8 880 525	2) 100 C w/Alu Z) Not r DP (Inche upport Size 1-1/4 —	Dhm RTD : Iminum H equired es of Water Probe 7/8 2380 1568	3 wire, Inte lead r Column) Support size 1-1/4 — —
Dime	nsions (inche Probe Length A 4.188 2	es) B 2.250			5) 6) 	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 2 - 1/2	50# 000# Single S Probe 7/8 880 525 396	2) 100 C w/Alu Z) Not r DP (Inche upport Size 1-1/4 — —	Dhm RTD : Iminum H equired es of Water Probe 7/8 2380 1568 1283	3 wire, Inte lead r Column) Support size 1-1/4 — — —
Dime AR0 AR	nsions (inche Probe Length A 4.188 2 6.625 3	B 2.250 3.125			5) 6) B • • •	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4	50# 000# Allowable Single S Probe 7/8 880 525 396 283 107	2) 100 C w/Alu Z) Not r DP (Inche upport Size 1-1/4 — — — —	Dhm RTD : Iminum H equired es of Water Probe 7/8 2380 1568 1283 1117	3 wire, Intelead
Dime AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3	B 2.250 3.125 3.125			5) 6) B J A	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5	50# 000# Allowable Single S Probe 7/8 880 525 396 283 197 152	2) 100 C w/Alu Z) Not r DP (Inche upport Size 1-1/4 — — — —	Dhm RTD : uminum H equired es of Water Double S Probe 7/8 2380 1568 1283 1117 980 757	3 wire, Inte lead r Column) Support • Size 1-1/4 — — — — — —
Dime AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3	B 2.250 3.125 3.125			5) 6) 	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6	50# 200# Allowable Single S Probe 7/8 880 525 396 283 197 153 126	2) 100 C w/Alu Z) Not r DP (Inche upport Size 1-1/4 — — — — — —	Dhm RTD : uminum H equired es of Water Double S Probe 7/8 2380 1568 1283 1117 980 757 689	3 wire, Inte lead r Column) Support : Size 1-1/4 — — — — — — — — —
Dime AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3	B 2.250 3.125 3.125			5) 6) B • • • • • • •	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8	50# 200# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114	2) 100 C w/Alu Z) Not r DP (Inche Upport Size 1-1/4 — — — — — — — — — — 360	Dhm RTD : uminum H equired es of Water Double S Probe 7/8 2380 1568 1283 1117 980 757 689 512	3 wire, Inte lead r Column) Support : Size 1-1/4 — — — — — — — — — — — — — —
Dime AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3 Probe Width	B 2.250 3.125 3.125			5) 6) B 	316/316L SS 15 w/Dbl Support 316/316L SS 33 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8 10	50# 000# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114 100	2) 100 C w/Alu Z) Not r DP (Inche Upport Size 1-1/4 — — — — — 360 240	Dhm RTD 3 Iminum H equired es of Water Probe 7/8 2380 1568 1283 1117 980 757 689 512 315	3 wire, Inte lead r Column) Support Size 1-1/4
Dime AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3 Probe Width C	B 2.250 3.125 3.125			5) 6) B 4 4	316/316L SS 15 w/Dbl Support 316/316L SS 33 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8 10 12	50# 000# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114 100 87	2) 100 C w/Alu Z) Not r DP (Inche Upport Size 1-1/4 	Dhm RTD : iminum H equired es of Water Double S Probe 7/8 2380 1568 1283 1117 980 757 689 512 315 250	3 wire, Inte lead r Column) Support size 1-1/4
Dime AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3 Probe Width C	B 2.250 3.125 3.125			5) 6) B 4 4 4 4	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8 10 12 12 14	50# 000# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114 100 87 53	2) 100 C w/Alu Z) Not r DP (Inche Upport Size 1-1/4 — — — — — — — 360 240 175 147	Dhm RTD : iminum H equired es of Water Double S Probe 7/8 2380 1568 1283 1117 980 757 689 512 315 250 195	3 wire, Inte lead r Column) Support size 1-1/4
Dime AR0 AR AR1 AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3 Probe Width C .5 875	B 2.250 3.125 3.125			5) 6) B 4 4 4 4 4	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8 10 12 14 16	50# 000# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114 100 87 53 —	2) 100 C w/Alu Z) Not r DP (Inche Upport Size 1-1/4 — — — — — 360 240 175 147 113	Dhm RTD : iminum H equired es of Water 7/8 2380 1568 1283 1117 980 757 689 512 315 250 195 —	3 wire, Intelead r Column) Support size 1-1/4
Dime AR0 AR AR1 AR1 AR0 AR	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3 Probe Width C .5 .875 1.25	B 2.250 3.125 3.125			5) 6) B A A A	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8 10 12 14 16 18	50# 200# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114 100 87 53 —	2) 100 C w/Alu Z) Not r DP (Inche Size 1-1/4 — — — — 360 240 175 147 113 90	Dhm RTD : iminum H equired es of Water 7/8 2380 1568 1283 1117 980 757 689 512 315 250 195 — —	3 wire, Intelead r Column) Support size 1-1/4
Dime AR0 AR AR1 AR1 AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3 Probe Width C .5 .875 1.25	B 2.250 3.125 3.125			5) 6) B 4 4 4 4 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8 10 12 14 16 18 20	50# 200# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114 100 87 53 — 53 —	2) 100 C w/Alu Z) Not r DP (Inche Size 1-1/4 — — — — — 360 240 175 147 113 90 74	Dhm RTD : iminum H equired es of Water 7/8 2380 1568 1283 1117 980 757 689 512 315 250 195 — — —	3 wire, Intelead r Column) Support size 1-1/4
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Dime AR0 AR AR1 AR1 AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3 Probe Width C .5 .875 1.25	B 2.250 3.125 3.125			5) 6) 	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8 10 12 14 16 18 20 24 26	50# 200# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114 100 87 53 — - - - - - - - - - - - - -	2) 100 C w/Alu Z) Not r DP (Inche Size 1-1/4 — — — — 360 240 175 147 113 90 74 68 50	Dhm RTD : iminum H equired es of Water Probe 7/8 2380 1568 1283 1117 980 757 689 512 315 250 195 — — — — — —	3 wire, Intelead r Column) Support size 1-1/4 960 700 585 450 360 295 270 215
Dime AR0 AR AR1 AR1 AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3 Probe Width C .5 .875 1.25	B 2.250 3.125 3.125			5) 6) B A A I I I I I I I I I I I I I I I I I	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8 10 12 14 16 18 20 24 26 30	50# 200# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114 100 87 53 — - - - - - - - - - - - - -	2) 100 C w/Alu Z) Not r DP (Inche Size 1-1/4 — — — — 360 240 175 147 113 90 74 68 50 34	Dhm RTD : Iminum H equired es of Water Probe 7/8 2380 1568 1283 1117 980 757 689 512 315 250 195 — — — — — — — —	3 wire, Inte lead r Column) Support • Size 1-1/4 — — — — — 960 700 585 450 360 295 270 215 155
Dime AR0 AR AR1 AR1 AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3 Probe Width C .5 .875 1.25	es) B 2.250 3.125 3.125			5) 6) 	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8 10 12 14 16 18 20 24 26 30 32 22	50# 000# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114 100 87 53 — — — — — — — — — — — — —	2) 100 C w/Alu Z) Not r DP (Inche Upport Size 1-1/4 — — — — — 360 240 175 147 113 90 74 68 50 34 —	Dhm RTD : iminum H equired es of Water Probe 7/8 2380 1568 1283 1117 980 757 689 512 315 250 195 — — — — — — — — — — —	3 wire, Inte lead r Column) Support • Size 1-1/4 — — — — — 960 700 585 450 360 295 270 215 155 —
Dime AR0 AR AR1 AR1 AR0 AR AR1	nsions (inche Probe Length A 4.188 2 6.625 3 6.625 3 Probe Width C .5 .875 1.25	es) B 2.250 3.125 3.125		tting w/SS Ferule	5) 6) 	316/316L SS 15 w/Dbl Support 316/316L SS 30 w/Dbl Support Pipe Size (inches) 2 2-1/2 3 3-1/2 4 5 6 8 10 12 14 16 18 20 24 26 30 32 36 10	50# 000# Allowable Single S Probe 7/8 880 525 396 283 197 153 126 114 100 87 53 — — — — — — — — — — — — —	2) 100 C w/Alu Z) Not r DP (Inche Upport Size 1-1/4 — — — — — 360 240 175 147 113 90 74 68 50 34 — —	Dhm RTD : iminum H equired es of Water Probe 7/8 2380 1568 1283 1117 980 757 689 512 315 250 195 — — — — — — — — — — — —	3 wire, Inte lead r Column) Support • Size 1-1/4 — — — — 960 700 585 450 360 295 270 215 155 — 155 — —



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PRESO

racine

(RFI) Racine Flow Meter Group

DYNASONICS Flo-tech



METERING FIOW ΙP Q Μ F U F Ν Т

Model AF Ellipse® Pitot Tube **Annular Flanged Flow Meter**

Preso's patented elliptical design outperforms and provides greater accuracy than traditional differential pressure flow measurement devices. This differential pressure flow meter is designed with a series of ports facing the upstream velocity pressures, as well as flow sensing ports strategically located ahead of the trailing edge flow separation.

Features

- Patented elliptical design outperforms traditional devices
- Single point pipe entry for DP, temperature and static pressure
- No dampening software required
- Lowest pressure loss in industry (typically 3% of DP in a 12" line) due to its patented aerodynamic profile
- NIST traceable calibration: Optional independent labs

Benefits

- Accuracy: ±0.75% of reading, repeatability: ±0.1% of reading
- Turndown Ratio: 17:1; no vacuum effects
- No moving parts equals long, trouble-free service life
- True static pressure measurement rather than a calculated value
- Overcomes loss of accuracy caused by fluid separation at the sensor body

The multi-ported, self averaging flow element consists of an elliptical shape with two independent flow sensing chambers. The impact velocity sensing holes (high pressure) are located along the leading edge and the true static sensing holes (low pressure) are on the exterior probe side. Model AF comes with instrument shut-off valves with connections to accept a transmitter or direct indicating meter.

> ISO 9001:2000



1-800-632-7337



Specifications

Applications:	Air, Liquids and Gases
Pipe Sizes:	2 to 72 inches (50 to 1830 mm)
Pressure:	Vary per flange ratings
Temperature:	Vary per flange ratings
Accuracy:	± 0.75% of reading
Turndown Ratio:	17:1 with no vacuum effect
Standard Components:	T-type head, 316 SS ¼" or ½" FNPT connection CS 3000 lb. weld fitting – ASTM A105 316/316L SS Ellipse sensor Instrument valves (2 per sensor) – ½", CS 316 SS ID tag with wire 150 lbs. 316/316L SS sensor flange CS gasket with SS spiral wound ring CS mounting flange, 150 lbs. ASTM A 105 with nuts and bolts
Reynolds Number:	Greater than 75,000 maintains most accurate flow measurements Less than 75,000 consult factory for estimated results
Resonance:	If greater than 0.8, use double support per ASME PTC 19.3



Model AF Ellipse[®] Pitot Tube Annular Flanged Flow Meter

Part Number Construction: PAF0(1/2") PAF (7/8") PAF1 (1-1/4") PAF2 (2-1/4")

					H											
ipe Size	Pipe Size	Pipe Orie	ntation	Prob	e Mater	rial	Instrume	nt Con	nection	Pipe	Mount	ing	In	strumer	nt Valve	*
AF/PAF0)	(PAF1/PAF2)	A) Horizo	ntal	1) 3	16/316L	-SS	(PAF/PA	F1/PAF	2)	1) A	105 CS	3000#	(P.	AF/PAF	1/PAF2)
2 inch	A) 12 inch	B) Vertica	al	2) N	lonel®		A) 1/2" N	IPT		2) 31	16/316	L SS 300	0# A)	1/2" N	eedle CS	S
2-1/2 inch	B) 14 inch			3) Ir	lconel®		B) 1/2" S	Socket		3) A	105 CS	3000#	B)	1/2" N	eedle SS	3
3 inch	C) 16 inch			4) H	astelloy	R	C) TT3 (ntegral	3 Valve	W.	/DDI Si	upport	C)	1/2" G	ate CS	
3-1/2 inch	D) 18 inch			X) C	ther (co	onsult	Trans	-Mount)	()		. ee 200	0# D)	1/2" G	ate SS	
4 inch	E) 20 inch			fa	actory to	o review	D) TT5 (ntegral	, 5 Valve	4) 3 W	/Dbl Si	L 33 300 Innort	^{0#} Z)	Not red	quired	
5 inch	F) 24 inch			a	pplicatio	on)	Trans	-Mount)	Z) N	ot requ	ired	In	strumer	nt Valve	
6 inch	G) 30 inch	Schedule	Schedu	ule			F) Trans	mitter F	lange	_,			(P	AF0)		
8 inch	H) 36 inch	(PAF0)	(PAF/P	AF1/PA	(F2)		Conn	ection	lange				A)	1/4" Ne	eedle CS	3
10 inch	I) 42 inch	A) Std/40/40S	A) Std	G) 100) L) X	XH	Inchange		nection				B)	1/4" Ne	eedle SS	3
12 inch	J) 48 inch	B) 80/80S/XS	B) 20	H) 120) M) 5	S			nection				Z)	Not red	quired	
14 inch	K) 60 inch	C) 160	C) 30	I) 140) N) 10	0S		пт					*N	OTE. Tr	ansmitte	۶r
16 inch	L) 72 inch	D) XXH	D) 40	J) 160	O) 4	0S	A) 1/4" M	IPT					Fla	ange Co	nnectio	n
18 inch		E) 5S	E) 60	K) XH	P) 8	0S							Op	otions av	vailable	
20 inch	NOTE:	F) 10S	F) 80			Col	nnection						wh	nen Opti	on E un	der
24 inch	PAF0 installs					PAF	0 PAF	PAF1	PAF2				Ins	strumen	t Conne	ction
30 inch	on pipe sizes 2"					A) 3	4" 1-1/4"	1-1/2"	3" RF	Flange 1	50# CS	;	IS for	selected	1. (CONSL informa	JIL Ation)
36 inch	through 5" only					B) 3	4 " 1-1/4"	1-1/2"	3" RF	Flange 3	800# CS	;	Id	JULY IO	monna	
	(A through F					C) 3	4" 1-1/4"	1-1/2"	3" RF	Flange 6	600# CS	5	RTD			
L	options)					D) 3	4" 1-1/4"	1-1/2"	3" RF	Flange 9	00/150	0# CS	1) 10	U Ohm F	HD3w	Ire
						E) 3	4" 1-1/4"	1-1/2"	3" RF	Flange 1	50# SS		W/	Explos	Ion Proo	i Head
						F) 3	4" 1-1/4"	1-1/2"	3" RF	Flange 3	800# SS		2) 10	0 Ohm H	RID 3 w	ire,
						- G) 3	4" 1-1/4"	1-1/2"	3" KF	Flange 6	00# SS		Int	egral w/	Aluminu	m He
						п) ч	/4 1-1/4	1-1/2	энг	riange s	00/150	10# 55	Z) NC	t require	ea	
imension	s (inches)	[]		Г		1	-		Ma	aximum	Allow	able DF	(Inche	s of Wa	ater Col	lumn)
			_		ĥ	[] E	3		Pip	oe Size	Sii	ngle Supj Probe Siz	port :e	Dou P	ble Sup robe Siz	port :e
_		一				_			(ir	nches)	7/8	1-1/4	2-1/4	7/8	1-1/4	2-1/4
Probe	Length		- -+				-		, , , , , , , , , , , , , , , , , , ,	2	880	—	—	2380	—	—
-	A B		н. — — —	K		1			2	2-1/2	525	_	_	1568	_	_
AFO 6.6	62 3.13									3	396	—		1283	—	—
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RFI) Racine Flow Meter Group



FLOW FΤ F RIN Μ Ρ G F Q U Μ F N T

Model AS Ellipse[®] **Annular Flow Meter**

Preso's patented elliptical design outperforms and provides greater accuracy than traditional differential pressure flow measurement devices. This differential pressure flow meter is designed with a series of ports facing the upstream velocity pressures, as well as flow sensing ports strategically located ahead of the trailing edge flow separation.

Features

- Patented elliptical design outperforms traditional devices
- Single point pipe entry for DP, temperature and static pressure
- No dampening software required
- Lowest pressure loss in industry (typically 3% of DP in a 12" line) due to its patented aerodynamic profile
- NIST traceable calibration: Optional independent labs

Benefits

- Accuracy: ±0.75% of reading, repeatability: ±0.1% of reading
- Turndown ratio: 17:1; no vacuum effects
- No moving parts equals long, trouble-free service life
- True static pressure measurement rather than a calculated value
- Overcomes loss of accuracy caused by fluid separation at the sensor body

The multi-ported, self averaging flow element consists of an elliptical shape with two independent flow sensing chambers. The impact velocity sensing holes (high pressure) are located along the leading edge and the true static sensing holes (low pressure) are on the exterior probe side. Model AS comes with instrument shut-off valves with provisions to accept a transmitter or direct indicating meter.

> True static sensing holes

Impact velocity sensing holes

ISO 9001: 2000

1-800-632-7337

Specifications

Applications:	Steam
Pipe Sizes:	2 to 48 inches (50 to 1220 mm)
Pressure:	600 PSI (4100 kPa) max.
Temperature:	480 °F (250 °C) max.
Accuracy:	± 0.75% of reading
Turndown Ratio:	17:1 with no vacuum effect
Standard Components:	T-type head, 316 SS ½" FNPT connection CS compression fitting with SS ferrule CS 3000 lb. weld fitting – ASTM A105 316/316L SS Ellipse sensor 316 SS ID tag with wire
Reynolds Number:	Greater than 75,000 maintains most accurate flow measurements Less than 75,000 consult factory for estimated results
Resonance:	If greater than 0.8, use double support

Model AS Ellipse[®] Annular Flow Meter

Part Number Construction

PAS (7/8") PAS1 (1-1/4")

Pipe Size (PAS)	Pipe Size (PAS1)
A) 2 inch	A) 12 inch
B) 2-1/2 inch	B) 14 inch
C) 3 inch	C) 16 inch
D) 3-1/2 inch	D) 18 inch
E) 4 inch	E) 20 inch
F) 5 inch	F) 24 inch
G) 6 inch	G) 30 inch
H) 8 inch	H) 36 inch
I) 10 inch	I) 42 inch
J) 12 inch	J) 48 inch
K) 14 inch	
	Sched A) Std B) 20

Pip A) B)	be Orientation Horizontal Vertical
Pro	be Material —
1)	316/316L-SS
2)	Monel
3)	Inconel®
4)	Hastelloy®
X)	Other (consult factory for information)
e	
	Pir A) B) Pro 1) 2) 3) 4) X) e G)

M) 5S

N) 10S

0) 40S

P) 80S

H) 120

I) 140

J) 160

K) XH

C) 30

D) 40

E) 60

F) 80

Instrument Connection
A) 1/2" NPT
B) 1/2" Socket
C) TT3 (Integral 3 Valve Trans-Mount)
D) TT5 (Integral 5 Valve Trans-Mount)
E) Transmitter Flange
Connection
Connection

A) CS Compression Fitting w/SS Ferrule B) SS Compression Fitting w/SS Ferrule

Options available when Option **E** under Instrument Connection is selected. (consult factory for information) Pipe Mounting 1) A105 CS 3000# 2) 316/316L SS 3000# 3) A105 CS 3000# w/Dbl Support (see below) 4) 316/316L SS 3000# w/Dbl Support

Instrument Valve* A) 1/2" Gate CS w/cross B) 1/2" Gate SS w/cross Z) Not required *NOTE: Transmitter Flange Connection

RTD (Use with Instrument Connection option E only)

1) 100 Ohm RTD 3 wire w/Explosion Proof Head 2) 100 Ohm RTD 3 wire, Integral w/Aluminum Head Z) Not required

1-1/4

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_

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960

700

585

450

360

295

270

215

155

_

Maximum Allowable DP (Inches of Water Column) Single Support **Double Support Pipe Size Probe Size Probe Size** (inches) 7/8 1-1/4 7/8 в 2 880 2380 _ 2-1/2 525 1568 3 396 1283 _ 3-1/2 283 1117 4 197 980 5 153 _____ 757 6 126 689 Α 8 114 360 512 10 100 240 315 175 250 12 87 53 147 195 14 113 16 ____ ____ 18 90 _ _ 20 74 24 68 26 50 34 30 32 _ _ _ 36 ____ ____ 42 ____ ____



8635 Washington Avenue Racine, WI 53406-3738 USA Tel: (262) 639-6770 Fax: (262) 417-1148 Toll Free: (800) 632-7337

Preso and Ellipse are registered trademarks of Racine Federated Inc. Inconel is a registered trademark of Special Metals Corporation Hastelloy is a registered trademark of Haynes International Form No. 4-25-01 AS Rev. 1/07 Printed in USA

Dimensions (inches)

Р	robe Leng	gth	P	robe W
	Α	В		С
AS	6.625	5.813	AS	.875
AS1	6.750	5.813	AS1	1.25





FLOW METERING F Ρ ΝT Q U t ME

Model ASF Ellipse[®] Pitot Tube **Annular Flow Meter**

Preso's patented elliptical design outperforms and provides greater accuracy than traditional differential pressure flow measurement devices. This differential pressure flow meter is designed with a series of ports facing the upstream velocity pressures, as well as flow sensing ports strategically located ahead of the trailing edge flow separation.

Features

- Patented elliptical design outperforms traditional devices
- Single point pipe entry for DP, temperature and static pressure
- No dampening software required
- Lowest pressure loss in industry (typically 3% of DP in a 12" line) due to its patented aerodynamic profile
- NIST traceable calibration: Optional independent labs

Benefits

- Accuracy: ±0.75% of reading, repeatability: ±0.1% of reading
- Turndown ratio: 17:1: no vacuum effects
- No moving parts equals long, trouble-free service life
- True static pressure measurement rather than a calculated value

sensing holes

Overcomes loss of accuracy caused by fluid separation at the sensor body

The multi-ported, self averaging flow element consists of an elliptical shape with two independent flow sensing chambers. The impact velocity sensing holes (high pressure) are located along the leading edge and the true static sensing holes (low pressure) are on the exterior probe side. Model ASF comes with instrument shut-off valves with connections to accept a transmitter or direct indicating meter.





1-800-632-7337



Specifications

Applications:	Steam
Pipe Sizes:	2 to 48 inches (50 to 1220 mm)
Pressure:	Vary per flange ratings
Temperature:	Vary per flange ratings
Accuracy:	± 0.75% of reading
Turndown Ratio:	17:1 with no vacuum effect
Standard Components:	T-type head, 316 SS ½" FNPT connection CS compression fitting with SS ferrule CS 3000 lb. weld fitting – ASTM A105 316/316L SS Ellipse sensor 316 SS ID tag with wire
Reynolds Number:	Greater than 75,000 maintains most accurate flow measurements Less than 75,000 consult factory for estimated results
Resonance:	If greater than 0.8, use double support per ASME PTC 19.3



Model ASF Ellipse[®] Pitot Tube Annular Flanged Flow Meter

Part Number Construction: PASF (7/8") PASF1 (1-1/4") PASF2 (2-1/4")

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A) 2 inch	A) 12 inch					3)		C)	113 (lr	itegral 3	valve	3)	A105 CS 3000 w/Dbl Support)# E	5) 1/2" Gate S w/orcco	iS
B) 2-1/2 inch	B) 14 inch	_				4)	Hastelloy		I rans-	Mount)			(see below)		W/Cross	d
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D) 3-1/2 inch	D) 18 inch						information)		Trans-	Mount)		(1	w/Dbl Support	t *N	OTE: Transmitt	ər
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I) 10 inch	I) 42 inch	D) 40	J)	160	0)	40S	PASEO	PASE	PASE		,			fa	ctory for inform	ation)
J) 12 inch	J) 48 inch	E) 60	ĸ) XH	P)	80S	A) 3/4	1 1//	1_1/2	ער ד ר דר דר דר ויי און	DE Elona	o 150# (re			_
K) 14 inch		F) 80		'			A) 74 B) 3/-	1 1/4	1_1/2	. J)	DE Elong	o 200# (RTD		
							C) 3/4	1-1/4	1-1/2	. J)	RE Fland	c 300# (□ 600# (55 rc	1) 100		wire
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PRESO

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(RFI) Racine Flow Meter Group

Toll Free: (800) 632-7337

DYNASONICS Flo-tech

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METERING FIOW F IPME QU Ν Т

PRESO

Model AHL Ellipse® Pitot Tube **Annular High Pressure Hot Tap Flow Meter**

Preso's patented elliptical design outperforms and provides greater accuracy than traditional differential pressure flow measurement devices. This differential pressure flow meter is designed with a series of ports facing the upstream velocity pressures, as well as flow sensing ports strategically located ahead of the trailing edge flow separation.

Features

- Hot-tap model installs without system shutdown
- Single point pipe entry for DP, temperature and static pressure
- No dampening software required
- Lowest pressure loss in industry (typically 3% of DP in a 12" line) due to its patented aerodynamic profile
- Optional NIST traceable calibration

Benefits

- Accuracy: ±0.75% of reading
- Repeatability: ±0.1% of reading
- Turndown Ratio: 17:1; no vacuum effects
- No moving parts equals long, trouble-free service life
- True static pressure measurement rather than a calculated value
- Overcomes loss of accuracy caused by fluid separation at the sensor body

The multi-ported, self averaging flow element consists of an elliptical shape with two independent flow sensing chambers. The impact velocity sensing holes (high pressure) are located along the leading edge and the true static sensing holes (low pressure) are on the exterior probe side. Model AHL comes with instrument shut-off valves or optional integral manifold valve for direct transmitter mount.



True static sensing holes Impact velocity sensing holes

Specifications

Applications:	Air, Liquids and Gases
Pipe Sizes:	2 to 30 inches (50 to 760 mm)
Pressure:	800 PSI (5515 kPa) max. Consult factory for higher pressure
Temperature:	800 °F (426 °C) max. Consult factory for higher temperature
Accuracy:	± 0.75% of reading
Turndown Ratio:	17:1 with no vacuum effect
Standard Components:	T-type head, 316 SS ¼" or ½" FNPT connection CS 3000 lb. weld fitting – ASTM A105 316/316L SS Ellipse sensor Instrument valves (2 per sensor) ¼" or ½", CS 316 SS ID tag with wire 150 lb. 316/316L SS sensor flange CS packing chamber with molythane or graphite packing gland CS packing chamber flange, 150 lb. with SS cap 316-SS isolation ball valve, NPT threaded CS threaded nuts and bolts CS nipples, schedule 40
Reynolds Number:	Greater than 75,000 maintains most accurate flow measurements Less than 75,000 consult factory for estimated results
Resonance:	Less than 0.8 but greater then 1.2. If greater than 0.8, use double support. System shutdown is required when the double support option is used

1-800-632-7337

www.preso.com

Select larger diameter Ellipse to avoid double support.

Model AHL Ellipse® Pitot Tube Annular High Pressure Hot Tap Flow Meter

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PA	HL1 (1	- 1/4 ")		Pi	pe Orientation		Pi	oe Mounti	na	Instrume	ent Valve
Pipe	e Size*	Pin	e Size*	A)	Horizontal	Insertion Mechanism	n/ 1)	A105 CS	3000#	A) ½" N	eedle CS
(PA	HL)	(PA		B)	Vertical	Isolation Ball valve	2)	316/316L	SS 3000#	B) ½" N	eedle SS
A) 2	, inch	A)	, 12 inch	Pr	obe Material	A) CS cage nipple &	rods 3)	Supplied	separately	C) ½" G	ate CS
B) 2	-1/2 inch	B)	14 inch	1)	316/316L-SS	B) SS cage nipple &	rods	by Preso		D) ½" G	ate SS
c) (3 inch	c)	16 inch	2)	Monel®	C) CS gear drive, ca	ge NO)TE: Ensur	e that DP	Z) Not r	equired
D) :	3-1/2 inch	D)	18 inch	3)	Inconel®	nippie & rous	no fa	ls within ra	nae noted	NOTE: T	ransmitter
E) 4	linch	E)	20 inch	4)	Hastelloy®	nipple & rods	or	chart belo	w. Double	Flange C	onnection
F) {	5 inch	F)	24 inch	X)	Other (consult	(Note: SS gear drive - SS	S for SL	pports are	not	Options when Or	available
G) (6 inch	G)	30 inch		factory to review	Nother	ree	commende	d for Hot	Instrume	nt Connection
H) 8	3 inch	Sched	ule —			A) Other	Та	p/Wet Tap	models.	is selecte	ed. (consult
) 1	0 inch	A) Std	G) 100	L) XXH		Packing Materia	al			factory fo	or information)
J) 1	2 inch	B) 20	H) 120	M) 5S	A) 1/2 INPT	1) Molythane (-6	65 °F to 200	°F, 140 °F			
N)	4 Inch	C) 30	I) 140	N) 10S	C) TT2 (Integral 2 Value	in water and	high water-b	ased fluids)	RTD —	
		D) 40	J) 160	O) 40S	Trans-Mount)	2) Viton [®] /Fluoro	carbon (-20	°F to 400 °	F) .	1) 100 Ohm	RTD 3 wire
		E) 60	K) XH	P) 80S	D) TT5 (Integral 5 Valve	3) Graphoil (120	0 °F)	00.05	,	w/ Explo	sion Proof Head
		F) 80			Trans-Mount)	4) EPDM (-65 °F	- to 300 °F, 4	00 °F in st	eam)	2) 100 Ohm	RTD 3 wire,
For	larger pi	pe sizes,			E) Transmitter Flange	5) Fluoronnyle (-	·05 F 10 300	г)		Integral v	//Aluminum Hea
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DA	4"	31-1⁄2"	42	2-1/2"			Dine Cir	Single	Support	Double	Support
AN	5"	32-1/2"	44	-1/2"	- THE		Pipe Siz	e Proi	je Size	Prope	Size.
S	6"	33-¾"	46	6-1/2"			(inches)	7/8	1-1⁄4	7/8	1-1⁄4
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(RFI) Racine Flow Meter Group

FLOW METERING EQUIPMENT

Toll Free: 800-632-7337 E-mail: info@preso.com

DYNASONICS Flo-tech



FIOW METERING F Q UIPMF N Т

Model AHS Ellipse® Pitot Tube **Annular Threaded Hot Tap Steam Flow Meter**

Preso's patented elliptical design outperforms and provides greater accuracy than traditional differential pressure flow measurement devices. This differential pressure flow meter is designed with a series of ports facing the upstream velocity pressures, as well as flow sensing ports strategically located ahead of the trailing edge flow separation.

Features

- Hot-tap model installs without system shutdown
- Single point pipe entry for DP, temperature and static pressure
- No dampening software required
- Lowest pressure loss in industry (typically 3% of DP in a 12" line) due to its patented aerodynamic profile
- Optional NIST traceable calibration

Benefits

- Accuracy: ±0.75% of reading
- Repeatability: ±0.1% of reading
- Turndown Ratio: 17:1; no vacuum effects
- No moving parts equals long, trouble-free service life
- True static pressure measurement rather than a calculated value
- Overcomes loss of accuracy caused by fluid separation at the sensor body

The multi-ported, self averaging flow element consists of an elliptical shape with two independent flow sensing chambers. The impact velocity sensing holes (high pressure) are located along the leading edge and the true static sensing holes (low pressure) are on the exterior probe side. Model AHS comes with instrument shut-off valves or optional integral manifold valve for direct transmitter mount.



True static sensing holes Impact velocity sensing holes





Number:

Resonance:

estimated results Less than 0.8 but greater then 1.2. If greater than 0.8, use double support. System shutdown is required when the double support option is used. Select larger diameter Ellipse to avoid double support.

Less than 75,000 consult factory for

1-800-632-7337

Model AHS Ellipse® Pitot Tube Annular Threaded Hot Tap Steam Flow Meter

Par DA			ction	_			_				_			-		
PA	H2 (%				L.								L			
PAHS1 (1-¼")			Pipe Orientation			Insertion Mechanism/			Pipe	Pipe Mounting			Instrument Valve			
				A)	Horizontal		ls	olation	Ball valve	1) A	105 CS	3000#	A) ½" G	ate CS		
			B)		A) CS cage nipple & rod			ls 2) 316/316L SS 3000#			# with	with cross				
Pipe Size		Pipe Siz	Pipe Size		be Material		B) SS ca	ge nipple & ro	ds 3) S	s 3) Supplied separately		y B) ½" G	B) 1/2" Gate SS		
(PAHS)		(PAHS1)		1)	1) 316/316L-SS		C) CS gear drive, cag		ar drive, cage		by Preso			With cross		
A) 2 inch		A) 14 Inch		2)	2) Monel®		D) SS gear drive cag		& rous	NOT	NOTE: Ensure that DP			Z) Not required		
B) 2-1/2 Inch		C) 18 inc	C) 18 inch		3) Inconel [®]			nipple	& rods	falls	within ra	inge noted	NOTE: T	ransmitter		
D) 3-1% inch		D) 20 inch		4)	Hastelloy®			(Note: SS gear drive - SS		on chart below. Doubl		 Flange Connection Options available 				
E) 4 inch		E) 24 inch		X)	A) Other (consult		X) Other		a welleu parts oni	^{//} Sup	Supports are not		when Or	when Option E under		
F) 5 inch				application)		lew			reco	recommended for Hot		Instrume	Instrument Connection			
G) 6	inch	Schedul	e —		Inc	trumont Conno	otion			iap/	wei iap	mouels.	is select	ed. (consult		
H) 8 inch		A) Std G) 100		L) XXH	Δ)	1/2" NPT	Packing Ma		cking Materi	al 🔟			factory f	or informati	on)	
I) 1	0 inch	B) 20	H) 120	M) 5S		1/2" Socket		1)	EPDM (-65 °	F to 300 °F, 400	0 °F in st	eam)				
J) 12 inch		C) 30	I) 140	N) 10S	C)	TT3 (Integral 3)	Valve	2)	Viton®/Fluor	ocarbon (-20 °F	to 400 °	'F)	RTD —			
K) 14 inch		D) 40	J) 160	0) 40S	•,	Trans-Mount)		3)	Graphoil (12)	JU °F)	-		1) 100 Ohm	RTD 3 wire	Э	
		E) 60	K) XH	P) 80S	D)	TT5 (Integral 5	Valve	4)	Fluoromyte (-65 °F to 300 °	F)		w/ Explo	sion Proot	Head	
		F) 80				Trans-Mount)		X)	Other				2) 100 Ohm	RID 3 wire	Э,	
*For larger p		pe sizes, see	the AH	Z brocł	nure. E) Transmitter F		lange				+ +		Integral w/Aluminum Head			
_	-			_		Connection	_						Z J Not requ	lieu		
	AHS "A'	" Dimensio	ns (incl	nes)												
	Size	Inserted	Retrac	ted				¥								
	2"	24-5/8	34"		- He		_				_					
	2-1/2"	25 35"			a H		₽	В		Maximum Allowable DP (Inches of Water Column)						
	3"	25-1/2	25-1⁄2 36"		48Pc	®┭┮®ѭ®₽	୴≂¤¤∽−				Single	Sunnort	Double	Double Support		
B	3-1⁄2"	26 37"								Pipe Size	Pro	be Size	Prob	e Size		
SCH. STANDA	4"	26-1⁄2 38"				- H				(inches)	7/2	1-1/4	7/2	1-1/4	1	
	5"	27-1⁄2 40"								2	880		2380			
	6"	28-¾	28-3/8 42"							2-1/2	525	_	1568	_		
	8"	30-3/8 46"								3	396	_	1283	—		
	10"	32-3/8 50"								3-1/2	283	—	1117	—		
	12"	34-3/8	54"					Å		4	197	—	980	—		
	14"	36-¾	57"			병				5	153	—	757	—		
	AHS1 "/	A" Dimensi	ons (ind	ches)						6	120	260	689 510	—		
	Size	e Inserted Retrac				_				0 10	100	240	315	960		
ARD	12"	38-1⁄2" 58-		3/,"						12	87	175	250	700		
	14"	40-1/2"	40-1⁄2" 62"			h wort -				14	53	147	195	585		
ğ	16"	42-1/2"	42-1⁄2" 66"			┝_╠┲╦╼╣				16	—	113	—	450	-	
AT S	18"	44-1/2"	2" 70"			宫		+		18	—	90		360		
Ξ	20"	46-1/2"	74"					•		20	—	74	—	295		
SCI	24"	50-1/2"	82"							24	<u> </u>	68		270		
			I I					PIPE								
		Probe Width)					I.D.								
		C				•		¥.								
-	AHL	.8/5		_			_	_								
	AHLT	1.25			C -											
Not	e: Probe	with optiona	l gear dr	rive no	t pictured. C	ontact factory f	for mo	ore infor	mation							
-		· ·	-			000		hinste	n Avonue							
						803 Rec	8635 Washington Avenue Bacine WI 53406-3738 LISA									
		DPES					Tel: 262-639-6770				PRESO and ELLIPSE are registered trademarks of Racine Federated Inc.					
					R	Fax:	262-	417-11	48		INCONEL and HASTELLOY	a MONEL are reg is a registered tr	pistered trademarks rademark of Haynes	or Special Metals (International	Jorporation	
– <i>i</i>						Toll	Free:	800-63	2-7337		VITON is a re Form No. 4-2	gistered tradem 25-01 AHS Rev.	ark of DuPont Dow B 1/08 Printed in USA	lastomers		
ΗL	OW N	1 E I E R I N	IG E	QUIF	' M E N T	E-m	ail: inf	fo@pre	so.com		©2007 Rad	ine Federated	Inc., all rights rese	erved.		

RFI Racine Flow Meter Group

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