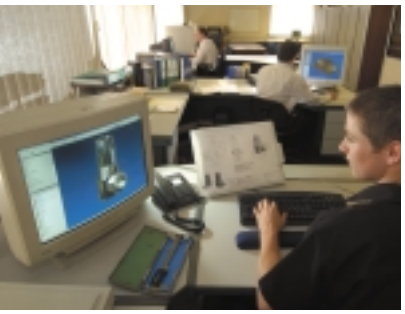
RHODES

SIGHT GLASSES AND FLOW INDICATORS

Company profile

Delta Fluid Products Ltd



Delta Fluid Products have been associated with the manufacturing of Valves and Fittings for Fluid and Gases for over a century.

Rhodes Flow Controls manufactures and supplies sight glasses and sight flow indicators, incorporating the brand names Rhodes and Universal. We are the UK market leader in the design and manufacture of sight flow indicator equipment, having been producing indicators since 1951. Rhodes and Universal sight flow indicators can be found in process and petrochemical plants all over the world.

Delta Fluid Products is, and always have been, proud of its production engineering expertise. Manufacturing is carried out using the company's own in-house resources which include pattern making, casting, stamping and machining of components on the latest numerical control machine tools.This expertise allows greater flexibility in terms of production volume - one piece or 50,000 pieces.

From our own stamping, machining and assembly, every single element of the manufacturing process is covered 'in house'. To control costs and to keep that all important, competitive advantage.

We employ a continuous programme of research and product development using the very latest innovations in manufacturing technology. This is a must for any manufacturing company who wishes to lead the way in the 21st century.

Our quality system has independently earned both ISO 9001 - 2000 and 14001 accreditation. However, we realise that the search for quality means more than just a certificate. Every member of our team has total commitment to quality, each and every day.

Under the Pressure Equipment Directive (PED) all pressure equipment placed on the market after 29th May 2002 must be assessed against the essential requirements contained within the pressure equipment regulations. As a leading International supplier, Delta Fluid Products has ensured that all products and standard documentation meet the directives requirements.

Every single aspect of the companies operations from raw materials purchased to final product despatch is carefully monitored to ensure that consistency and efficiency is top of everyone's priority list.

We boast highly committed personnel at all levels within our organisation. Investors in People is an award we are proud to be associated with. Our business is driven by market need and aims to provide the best product at the most competitive price with the highest quality of service.

Wade SPERRYN GAS CONTOLS NABIC® brownall RHODES iat INGOLSTADT

CE

INVESTOR IN PEOPLE

ISO 9001
Reg No. Q5973

ISO 14001
Reg No. EMS 78657

200 SERIES Stainless Steel Sight Flow Indicators

Description

A low cost, all stainless steel sight flow indicator available as a straight through indicator with spout (Figure 233) or fitted with a flap and scale plate to give an indication of flow rate. (Figure 234).

Dimensions

Size (mm)	Length(mm)	Weight(kg)
15	70	1.2
20	70	1.2
25	90	2.2
40	110	4.1
50	130	7.2

Figure 233

Materials of Construction

Body	ASTM A351 CF8M
Covers	ASTM A351 CF8M
Glass	Toughened Soda Lime or Borosilicate Glass
Gaskets	PTFE
Nuts and through Bolt	316 Stainless Steel
Flap (Figure 234 only)	316 Stainless Steel
Scaleplate (Figure 234 only)	316 Stainless Steel

Figure 234

Conversion of Flap position to Approximate Flow Rate (l/min, water)

Size	Scale Reading									
	1	2	3	4	5	6	7	8	9	10
15mm	2.6	3.7	4.4	4.7	5.1	5.6	6.3	8.1	8.7	11.0
20mm	2.6	3.7	4.4	4.7	5.1	5.6	6.3	8.1	8.7	11.0
25mm	3.0	5.0	6.5	8.0	9.5	11	13	16.0	20.0	26.0
40mm	10	13	16	18	20	23	25	31.0	37.0	42.0
50mm	15	20	24	27	30	35	40	56.0	70.0	109.0

Maximum Ratings

Fig	Pressure (Barg)	Temp.(°C)
233	10	200
234	10	200

Standard End connections

BSP Taper
BSP Parallel
NPT
Socket Weld

CE

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Fully P.E.D. compliant *CE marked where relevant*

400 SERIES

Straight Through Sight Flow Indicator with Spinner/Ball

Spinner Type
Figure 400 Gunmetal or Stainless Steel

Description

A low cost, 'entry level' sight flow indicator with either a high sensitivity spinner or ball operating from 0.7 l/m (water). The nitrile seals and nylon spinner or PTFE ball give excellent chemical resistance which is further enhanced in the stainless steel version by the use of borosilicate glass as standard.

These compact sight flow indicators are used extensively in plant protection applications to show coolant or lubrication flow to pumps, compressors and engines.

As an added advantage the series 400's can be used in any orientation, apart from the 'ball type', which needs to be in the horizontal plane.

Dimensions

Size (mm)	Length (mm)	Weight (kg)	Flowrate (l/h, water) Minimum	Maximum
8	76	0.5	30	200
10	76	0.5	50	450
15	76	0.6	60	600
20	83	0.6	120	1600
25	89	1.1	300	1600

Materials of construction

Body (choice)		Gunmetal	BS EN 1928 CB419K
		Stainless Steel	ASTM A351 CF8M
Cover Rings	Gunmetal	Brass	BS2872 CZ122
	St. Steel	Nickel Plated Brass	BS2872 CZ122
Glass	Gunmetal	Soda Lime	BS3463
	Stainless	Borosilicate	DIN7080
Gaskets		Nitrile O Ring	BS128
Spinner Mounting Pin		Stainless Steel	316
Spinner		Nylon	
Ball		PTFE	

Ball Type
Figure 400B Gunmetal or Stainless Steel

Maximum Ratings

	Pressure (barg)	Temp.(°C)
Gunmetal	7	100
Stainless Steel	16	100

Standard End connections

BSP Taper
BSP Parallel
NPT

Fully P.E.D. compliant

CE marked where relevant

408 Straight Through Sight Flow Indicator with Spinner

S E R I E S

Description

This double sided indicator is suitable for mounting in a horizontal or vertical position. Operating over a wide flow range it extends the duties of the smaller Figure 400 into larger applications and to higher temperatures. It is available with flanged or screwed end connections and with a variety of material options. The stainless steel spinner and mounting pin give excellent corrosion resistance.

Figure 408

CE

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Dimensions

Size (mm)	Length (mm)	Weight (kg)	Flowrate (l/min, water) Minimum	Maximum
Screwed				
8	89	1.5	5.3	7.5
10	89	1.5	5.3	7.5
15	97	1.5	9.0	18.0
20	111	1.5	15.8	41.3
25	127	3.0	20.3	73.3
40	191	5.0	45	165
50	184	8.5	90	293
Flanged				
20	159	5.5	15.8	41.3
25	178	6.0	20.3	73.3
40	203	8.0	45	165
50	222	11.5	90	293
80	292	28.0	225	660
100	343	41.0	360	1173

Note: Length shown refers to ANSI 150 only, other lengths for alternative flanges available upon request.

Materials of Construction*

Body (choice)	Cast iron BS EN 1561 or Gunmetal BS EN 1928 CB419K or Carbon Steel ASTM A216 WCB or Stainless Steel ASTM A351 CF8M
Covers	Powder Coated Mild Steel BS EN 10025 S355J2G3
Glass	Toughened Soda Lime BS 3463 or Borosilicate Glass DIN 7080
Gaskets	Nickel Reinforced Graphite or PTFE
Nuts and through Bolts	Mild Steel or Stainless Steel (note 1) or Bolts to ASTM A193 Gr B7 and Nuts to ASTM A194 Gr 2H
Spinner & Mounting Pin	Stainless Steel

Note 1: Materials supplied in 'All Stainless' version.
**Where a choice exists, the standard material is shown in bold.*

Temperature Ratings

	Max (°C)
Cast Iron	180
Gunmetal	200
Carbon Steel	250
Stainless Steel	250

Maximum Working Pressures* (Barg) From Full Vacuum

Size (mm)	Cast Iron	Gun Metal	Carbon Steel	Stainless Steel
8	13.8	17.2	17.2	17.2
10	13.8	17.2	17.2	17.2
15	13.8	17.2	19.7	19.7
20	13.8	14.1	14.1	14.1
25	13.8	17.2	29.9	20.7
40	13.8	17.2	20.3	20.3
50	13.8	14.8	14.8	14.8
80	13.8	14.3	14.3	14.3
100	9.6	9.6	9.6	9.6

**At ambient temperature. Maximum pressure may be reduced by flange rating or by elevated temperatures. Please request further information if required.*

Options

- All Stainless Construction
- Mica Discs
- B7 Bolting
- 'Boro' Glass
- PTFE Gaskets

Standard End Connections

BSP Taper
BSP Parallel
NPT
Socket Weld
ANSI 150 RF
ANSI 300RF
BS10 Table D
BS10 Table E
ANSI 150FF
BS4504 PN16
BS4504 PN25

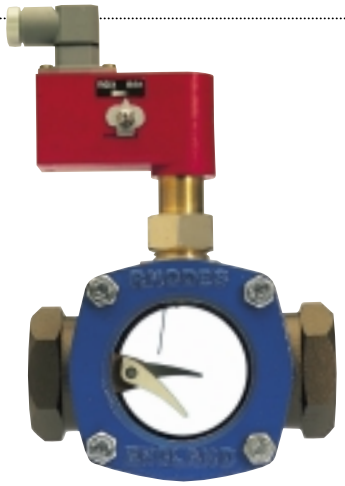
Other end connections available upon request

Fully P.E.D. compliant ***CE marked where relevant***

900 SERIES

Straight Through Sight Flow Indicators - Gunmetal

Figure 902



901/902

with Flow Fingers

Description

The models 901/902 general purpose indicators used by equipment manufacturers and process plant users, employs Rhodes' unique patented 'flow fingers' to provide flow indication. The flow fingers provide positive indication of clear and murky liquids even under slow, steady flow conditions. The 902 version is fitted with a flow switch.

Materials of Construction

Body	Gunmetal BS EN 1928 CB419K
Covers	Mild Steel BS EN 10025 S355J2G3
Flow fingers	Glass filled nylon
Glass	Toughened Soda Lime BS3463 or Borosilicate Glass DIN 7080
Gaskets	Nickel reinforced graphite or PTFE
Fasteners	Mild Steel Zinc Plated

**Where a choice exists, the standard material is shown in bold*

Figure 901

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Flow information (l/min, water)

Size (mm)	Scale Reading on 904									
	1	2	3	4	5	6	7	8	9	10
15/20	3	4	5	7	8	9	10	14	20	25
25	5	7	9	10	13	15	18	21	28	40
40	10	14	19	22	27	30	36	44	63	76
50	15	23	29	35	41	46	59	79	118	195

Dimensions 901, 902, 903 and 904

Screwed (mm)	15	20	25	40	50
Length (mm)	90	90	110	130	170
Weight (Kg)	0.9	0.9	1.7	3.1	5.8

Maximum Ratings

901 Pressure 16 Barg Temperature 170°C
902 Pressure 16 Barg Temperature 120°C

Series end Connections 901, 902, 903, 904

Screwed BSPT, BSPP, NPT

N.B. Model 901, 902, 903 and 904 not available with flanged ends

Figure 903

903

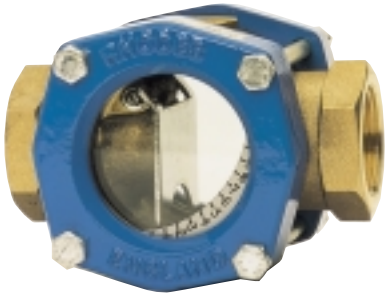
with Integral Spout

Materials of Construction

Body	Gunmetal BS EN 1928 CB419K
Covers	Mild Steel BS EN 10025 S355J2G3
Glass	Toughened Soda Lime BS3463 or Borosilicate Glass DIN 7080
Gaskets	Nickel reinforced graphite or PTFE
Fasteners	Mild Steel Zinc Plated

**Where a choice exists, the standard material is shown in bold*

Figure 904



904

with Flap and Scale Plate

Materials of Construction

As the 903 but with:

Flap	316 Stainless Steel
Scaleplate	316 Stainless Steel

Maximum Ratings 903 and 904

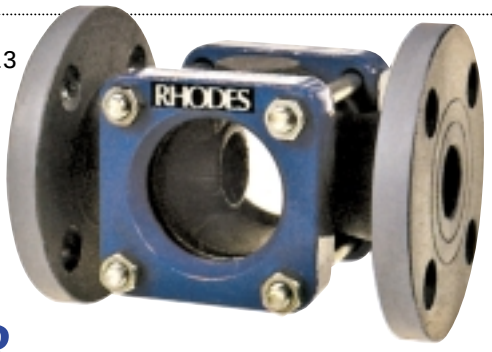
Pressure 16 Barg Temperature 200 °C

Fully P.E.D. compliant ***CE marked where relevant***

900 Straight Through Sight Flow Indicators - Cast Iron

S E R I E S

Figure 913



913
with Integral Spout

Materials of Construction

Body	Cast Iron BS EN 1561
Covers	Mild Steel BS EN 10025 S355J2G3
Glass	Toughened Soda Lime BS3463
Gaskets	Nickel reinforced graphite
Fasteners	Mild Steel Zinc Plated

Series end Connections 913 and 914

Flanged	ANSI 150FF, BS10 Table D,E,F BS4504 PN16, PN25 and PN40

N.B. Models 913 and 914 not available with screwed ends

Optional Extras

- Mica discs
- Borosilicate glass to DIN7080
- PTFE gaskets

903, 913, 923 and 933
with Integral Spout

Description

These two sided flow indicators feature an integral spout that produces a jetting action for turbulent flow thereby improving the viewing of clear liquids. The large viewing area allows the flow, colour and condition of the liquid to be observed and hence provide a check on product quality and consistency.

The indicators are suitable for both vertical and horizontal installation. The inclusion of a spout allows them to be used as drip indicators to show valve leaks, distillation or similar conditions

A variety of materials are available as standard.

Figure 914

914
with Flap and Scaleplate

Materials of Construction

As the 913 but with:

Flap	316 Stainless Steel
Scaleplate	316 Stainless Steel

Ratings 913 and 914

Max Pressure 16 Barg Max Temperature 180 °C
Min Temperature -10 °C

Flow information (l/min, water)

Size	Scale Reading on 914									
(mm)	1	2	3	4	5	6	7	8	9	10
15/20	3	4	5	7	8	9	10	14	20	25
25	5	7	9	10	13	15	18	21	28	40
40	10	14	19	22	27	30	36	44	63	76
50	15	23	29	35	41	46	59	79	118	195
80	82	95	109	123	139	159	187	229	296	350
100	91	118	145	168	200	255	302	370	560	700

Dimensions 913 and 914

Flanged (mm)	20	25	40	50	80	100
Length (mm)	140	140	180	220	260	310
Weight (Kg)	3.0	3.5	6.5	10.5	20.5	35.5

904, 914, 924 and 934
with Flap and Scale Plate

Description

This option of flow indicator incorporates a pivoted internal flap, which, by its position in relation to a graduated scale-plate, indicates any changes in the rate of flow of a liquid in a pipeline, from a trickle to full flow conditions.

The internal stainless steel flap is electro-polished to improve viewing in murky liquids. The indicators are suitable for both horizontal and vertical upward flows.

A variety of materials are available as standard.

900 SERIES — Straight Through Sight Flow Indicators - Carbon Steel

Figure 923

923

with Integral Spout

Materials of Construction

Body	Carbon Steel ASTM A216 WCB
Covers	Mild Steel BS EN 10025 S355J2G3
Glass	Toughened Soda Lime BS3463
Gaskets	Nickel reinforced graphite
Fasteners	Mild Steel Zinc Plated

Ratings 933 and 924

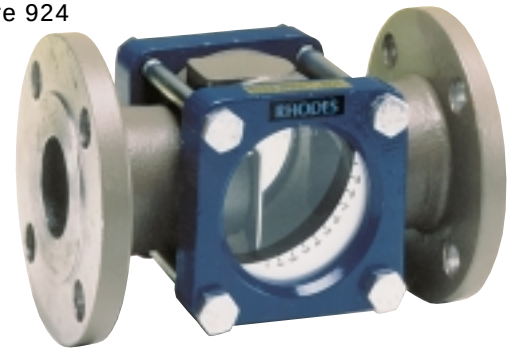
Pressure Ratings	Max Temperature: 250ºC
Full Vacuum to 25	Min Temperature: -30ºC

**At ambient temperature. Maximum pressure may be reduced by flange rating or by elevated temperatures. Please request further information if required.*

Dimensions 923 and 924

Screwed			Flanged		
Screwed (mm)	Length (mm)	Weight (Kg)	Flanged (mm)	Length (mm)	Weight (Kg)
15	90	0.9	–	–	–
20	90	0.9	20	140	3.0
25	110	1.7	25	140	3.5
40	130	3.1	40	180	6.5
50	170	5.8	50	220	10.5
			80	260	20.5
			100	310	35.5
			150	406	76

Figure 924



924

with Flap and Scaleplate

Materials of Construction

As the 923 but with:

Flap	316 Stainless Steel
Scaleplate	316 Stainless Steel

Flow information (l/min, water)

Size	Scale Reading on 924									
(mm)	1	2	3	4	5	6	7	8	9	10
15/20	3	4	5	7	8	9	10	14	20	25
25	5	7	9	10	13	15	16	20	26	35
40	9	13	17	20	24	27	32	39	57	70
50	13	20	26	31	37	43	52	70	106	150
80	77	91	104	118	132	148	175	206	250	300
100	84	113	138	161	190	240	283	340	500	630

Series end Connections 923 and 924

Screwed	BSPT, BSPP, NPT, socket weld, butt weld
Flanged	ANSI 150RF, ANSI 300RF, BS10 Table D,E,F, BS4504 PN16, PN25 and PN40

Other end connections available on request

Optional Extras

- Mica discs
- Borosilicate glass to DIN7080
- PTFE gaskets

900 SERIES

Straight Through Sight Flow Indicators - Stainless Steel

Figure 933

Figure 934

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933

with Integral Spout

Materials of Construction

Body	Stainless Steel ASTM A351 CF8M
Covers	Mild Steel BS EN 10025 S355J2G3
Glass	Toughened Soda Lime BS3463
Gaskets	Nickel reinforced graphite
Fasteners	Mild Steel Zinc Plated

Ratings 933 and 934

Pressure Ratings	Max Temperature: 250ºC
Full Vacuum to 25	Min Temperature: -30ºC

**At ambient temperature. Maximum pressure may be reduced by flange rating or by elevated temperatures. Please request further information if required.*

Dimensions 933 and 934

Screwed			Flanged		
Screwed (mm)	Length (mm)	Weight (Kg)	Flanged (mm)	Length (mm)	Weight (Kg)
15	90	0.9	–	–	–
20	90	0.9	20	140	3.0
25	110	1.7	25	140	3.5
40	130	3.1	40	180	6.5
50	170	5.8	50	220	10.5
			80	260	20.5
			100	310	35.5
			150	406	76

934

with Flap and Scaleplate

Materials of Construction

As the 933 but with:

Flap	316 Stainless Steel
Scaleplate	316 Stainless Steel

Flow information (l/min, water)

Size	Scale Reading on 934									
(mm)	1	2	3	4	5	6	7	8	9	10
15/20	3	4	5	7	8	9	10	14	20	25
25	5	7	9	10	13	15	16	20	26	35
40	9	13	17	20	24	27	32	39	57	70
50	13	20	26	31	37	43	52	70	106	150
80	77	91	104	118	132	148	175	206	250	300
100	84	113	138	161	190	240	283	340	500	630

Series end Connections 933 and 934

Screwed	BSPT, BSPP, NPT, socket weld, butt weld
Flanged	ANSI 150RF, ANSI 300RF, BS10 Table D,E,F, BS4504 PN16, PN25 and PN40

Other end connections available on request

Optional Extras

- All stainless steel construction
- Mica discs
- B7/2H fasteners
- Borosilicate glass to DIN7080
- PTFE gaskets

Fully P.E.D. compliant ***CE marked where relevant***

Sight Flow Indicator Classi

F	I	C	–	1	3	4	4

Description

F	I	Assembly

Material

C	13	ASTM A216 WCB Formerly BS1504-161-Gr.480
C	23	ASTM A352 Gr.LCC
C	33	ASTM A350 Gr.LF2
C	43	ASTM A216 WCB / BS1504-161-Gr.480
C	73	ASTM A352 Gr.LCB / BS1504-161-Gr.430-LT40
G	17	EN1928 CB491K Formerly BS1400 LG2 (Gunmetal)
G	37	ASTM B148 Ali-Bronze
I	18	BSEN1561 Formerly BS1452 Gr.220
S	14	ASTM A351 CF8M Formerly BS1504-316-C16
S	24	Hastelloy C274
S	44	ASTM A351 CK3MCun / 6MO UNS S31254
S	54	ASTM A890 4A / Duplex UNS S31803
S	84	ASTM A351 CF3 / BS1504-304-C12
S	94	Duplex ASTM A182 Gr.F51 use S54
S	A4	ASTM A351 CF3M / BS1504-316-C12
S	H4	ASTM A240 - 316 (wrought spec. for flanges)
S	J4	Hastelloy C22
S	K4	Hastelloy C276
S	N4	ASTM A351 CF8

Figure Number

03	400 Spinner Type
09	408
10	408HP
42	901, 931
43	902
44	903, 913, 923, 933
*45	904, 914, 924, 934
46	925, 935
47	926, 936
48	923DG, 933DG**
*49	924DG, 934DG**
50	923HP, 933HP
*51	924HP, 934HP
64	233
*65	234
66	400 Ball Type
74	Type (A) Straight Thru
75	Type (A) Right Angle
77	Type (B)
84	Type (A) S-Thru D/Glaze**
*	Items with flap and scaleplate mod specials
**	Double Glazed Units

Nominal Bore

00	8mm Screwed
05	10mm Screwed
10	15mm Screwed
15	20mm Screwed
20	25mm Screwed
30	40mm Screwed
35	50mm Screwed
40	25mm Flanged
50	40mm Flanged
55	50mm Flanged
57	60mm Flanged
60	65mm Flanged
65	80mm Flanged
70	100mm Flanged
80	150mm Flanged
80	160mm (926 & 936)
85	200mm Flanged
90	250mm Flanged
95	300mm Flanged
97	400mm Flanged

End Conn

0	Special C
1	BSP Tap
2	BSP Par
3	NPT
4	Butt We
5	BSPP BS
6	Socket W
B	ANSI 15
C	ANSI 30
D	Table D
E	Table E
F	Table F
G	ANSI 15
H	Table H
J	Table A
K	ANSI 60
L	PN6 BS
M	PN10 BS
N	PN16 BS
O	UNF
P	PN25 BS
Q	PN40 BS
R	ANSI 15
S	PN10SF
T	ANSI 30
U	ANSI 30
V	PN40SF
W	ANSI 90
X	ANSI 15
Y	ANSI 15
Z	PN16 BS

Mild Steel
Cover Material - BSEN 10025 S355 J2G3

Stainless Steel
Cover Material - ASTM A204 304

Note: All Stainless Steel Fig 400 Fitted with Toughened Borosilicate as Standard.
All Gunmetal fig 400 Fitted with Soda Glass as standard

Note: Fastener Standards

High Temp Bolting ASTM A193
Grade B7 or B7M: Carbon Steel Bolts
Grade BB: 304 Stainless Bolts
Grade B8M: 316 Stainless Bolts

Low Temp Bolting ASTM A320
Grade L7 or L7M: Carbon Steel Bolts
Grade BB: 304 Stainless Bolts
Grade B8M: 316 Stainless Bolts

Nuts ASTM A194
Grade 2H or 2HM: Carbon Steel Nuts
Grade 8: 304 Stainless Nuts
Grade 8M: 316 Stainless Nuts

Standard Zinc Plated and Standard Stainless 316 to BS.3692
(Grade 8.8 Bolting, Grade 8 for Nuts)

Standard Temperature Ratings
PTFE Joints: -150 to 200˚C (220 Max)
NRG Joints: -150 to 250˚C (350 Max)

fication Chart

4	0	–	B	1	S	P

ctions

erride
BS21
el BS21
Sch.80 (ANSI B16.25)
779
eld (ANSI B16.11)
RF
HP or ANSI 300RF
S10
S10
S10
FF for Cast Iron
S10
S10
HP
N 1092
EN 1092
EN 1092
EN 1092
EN 1092
RFSF
S EN 1092
RFSF
RTJ
S EN 1092
RFSF
0RTJ
0RFSF
0 Undrilled

Glass & Joints

	GLASS	JOINT	EXTRA
0	TSL	NRG	–
1	TSL	PTFE	_
2	TSL	NRG	MICA
3	Borosilicate	NRG	–
4	TSL	PTFE	MICA
5	Borosilicate	PTFE	–
6	Borosilicate	NRG	MICA
7	Borosilicate	PTFE	MICA
8	Metaglass	SST150	–
9	TSL	SST150	–
H	TSL	PTFE	PTCFE
K	TSL	VITON	–
L	Aluminosilicate	NRG	–
N	Borosilicate	Neoprene	–
P	TSL	PTFE	PTCFE
R	TSL	Neoprene	PTCFE
T	Borosilicate	SST150	–
X	TSL	Blue Gylon	–
B	Metaglass & Light Fitting		
C	Coated Glass or PTFE Joints		
D	Metaglass & PFA Joints		
E	Quartz PTFE		
G	Borosilicate Inner and Toughened Soda Lime Outer		
J	Annealed Borosilicate		
S	Sapphire Coated TSL & PTFE		

Additional 1

0	Not Applicable
1	B7 Bolting 2H Nuts Cadmium Plated
3	Covers as Body
4	3/8" NPT Drain Hole
5	Duplex Covers with Cad Plated Bolts
6	Stainless Steel Bolts
7	B7 Bolts
8	B8 (All Stainless)
9	Protection Disc Fitted
B	All Stainless Steel B7 Bolts 2H Nuts
G	Gunmetal Covers &/or Spinner
H	Light Fitting
J	B8 Bolting / MS Covers
K	Quality Impact Test M0110
L	L7 or PFA Lined
M	Protection Mesh (Metal)
N	Spout Removed / Mesh Covers
P	Nylon Spinner / all Stainless or FEP Lined
Q	Manganese Bronze Spinner with Alluminium-Bronze Spindle
R	Nylon Spinner
S	All Stainless
T	PTFE Spinner
V	PTFE Fingers

Additional 2

3	Covers as Body + Special Paint
7	B7 Bolts
8	B8 Bolts
9	Perspex Protection Shield
C	PFA Lined
D	MPI on Casting
F	Radiographic & MPI/DPI
H	Radiographic & Dye Pen Tests Covers as Body
I	Full Docs (Body No Only)
J	Charpy Test on Body
M	Radiography
N	PFA Lined and Special Paint
P	Special Paint
S	All Stainless
W	Wiper Fitted

900 SERIES Lined Sight Flow Indicators

Figure Lined 900 Series

CE

Declaration of Conformity

Description

These indicators are based on the popular Rhodes 900 series. They are two sided flow indicators lined with corrosion resistant fluoroplastic PFA and FEP. The linings are held in place by dovetail grooves machined into the cast body, allowing them to be used under full vacuum. All wetted parts are PFA/FEP together with either toughened soda lime or borosilicate glass. The indicators are available with a spout which produces a jetting action and turbulent flow thereby improving the viewing of clear liquids. The large viewing area allows the flow, colour and condition of the liquid to be observed and hence provides a check on product quality and consistency. The indicators are suitable for both vertical and horizontal installation. The inclusion of a spout allows them to be used as drip indicators to show valve leaks, distillation or similar conditions.

Materials of construction

Body	Cast Iron BS EN 1561
	(Other body materials available on request)
Lining	PFA
Covers	Mild Steel BS EN 10025 S355J2G3
Glass	Toughened Soda Lime BS3463 or
	Borosilicate Glass DIN7080
Gaskets	Nickel reinforced graphite
Fasteners	Mild Steel Zinc Plated

**Where a choice exists, the standard material is shown in bold*

Ratings

Pressure Ratings	Max Temperature: 200ºC
Full Vacuum to 20	Min Temperature: -10ºC

Dimensions

Nominal Bore (mm)	Length (mm)	Weight (kg)	Viewing Diameter (mm)
25	136	3.5	50
40	180	7.5	60
50	220	11	80
80	260	20	100
100	316	28	100

End Connections

ANSI 150
BS4504 PN10,16

Other flanges are available on request

Fully P.E.D. compliant ***CE marked where relevant***

Type A

Description

A simple, robust sight flow indicator, available in two patterns:straight through and angle type. Both have a good quality cast body recessed to hold toughened glass windows on two sides. The glasses are held in place by steel covers and high tensile bolts. Joint rings, made in a suitable material, fit into the same recess as the glass windows and consequently cannot be blown out by excessive pressure.

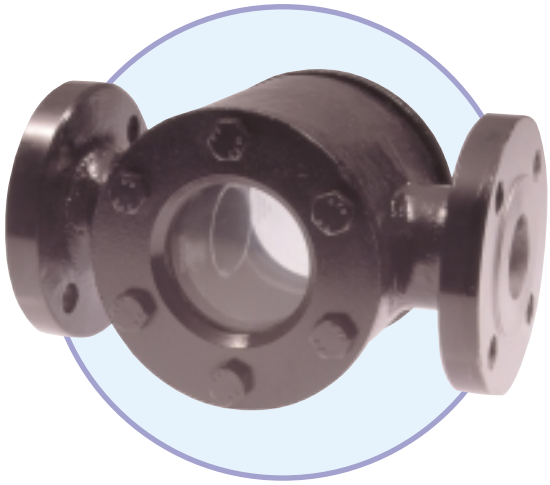


Figure Type A i

CE

Declaration of Conformity

Materials of Construction

Body	Cast Iron BS EN 1561
	Stainless Steel ASTM A351 CF8M
	Carbon Steel ASTM A216 WCB
Covers	Mild Steel BS EN 10025 S355J2G3
Glass	Toughened Soda Lime BS3463 or Borosilicate DIN 7080
Gaskets	NRG or PTFE
Fasteners	Mild Steel

Ratings

Body Material	Max Temp (°C)	Min Temp (°C)
Cast Iron	200	-10
Stainless Steel	250	-30
Carbon Steel	250	-20

End Connections

ANSI150RF, ANSI150FF
BS10 Table D,E,F
BS 4504 PN10, 16, 25

Dimensions

Nominal Bore (mm)	Length (mm)	Weight (kg)	Viewing Diameter (mm)	Pressure Rating (Barg)
25	229	9	60	20
40	229	13	70	20
50	279	20	89	20
65	279	22	89	20
80	343	33	120	18
100	425	60	152	16
150	406	60	152	16
200	464	86	210	14

Type B

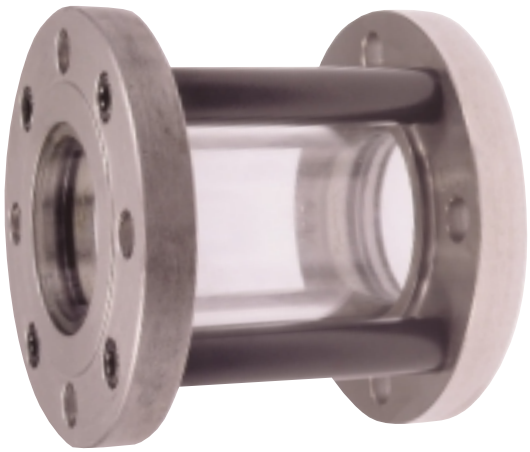


Figure Type B

Description

A tubular type indicator with a difference. The disadvantage with traditional tubular type sight flow indicators is that the joint has to be made by exerting pressure on the ends of the glass tube. This causes the glass to take the load of any distortion or expansion in the pipe line. The result is often a leaking joint or a broken glass. The Type B overcomes this by using a new method of sealing which allows the glass to move.

Materials of Construction

Flanges	Stainless Steel Carbon Steel
Glass	Borosilicate
'O' Rings	Nitrile Rubber
Fasteners	Mild Steel

Dimensions

Nominal Bore (mm)	Face-Face Length (mm)	Weight (Kg)
25	102	2
40	127	3.5
50	153	5
80	178	10
100	203	17
150	254	23

Ratings

Pressure (Barg)	Max Temperature: 100ºC
3	Min Temperature: 0ºC

End Connections

ANSI150RF, ANSI150FF
BS10 Table D, E, F
BS 4504 PN10, 16

Vessel Sight Glass

Description

This range of sight glass assemblies enables users to observe the contents of vessels in terms of level or volume and consequently to observe processes such as mixing, drying, fermentation, filtration, chemical reactions etc. Another important use is the observation of colour and consistency during the manufacturing process as an aid to safety during heating processes. These sight glass assemblies are suitable for use on vessels manufactured in accordance with BS5500.

Model 419 is a rectangular sight glass assembly and is available in a range of materials. Three sizes are available with the following clear view access 300mm x 25mm, 450mm x 40mm and 600mm x 50mm.

Figure 936

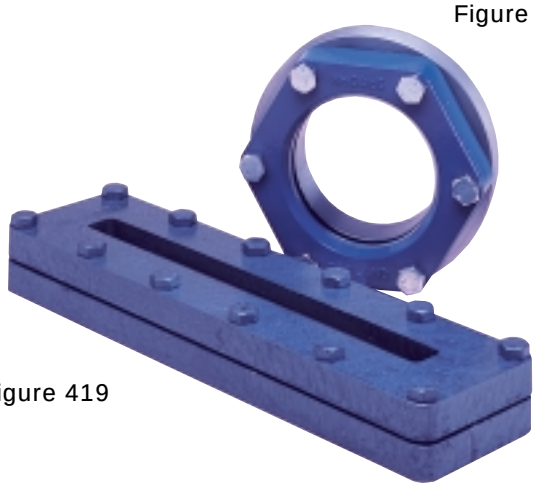


Figure 419

Fully P.E.D. compliant

CE marked where relevant

Bespoke Specifications

Description

The manufacture of ‘Bespoke’ units to a wide range of customer specifications has become the hallmark of the Rhodes range of indicators.

Delta Fluid Products have the design capability and manufacturing capacity to produce from single units up to large batch quantities of bespoke indicators. In addition to the standard materials of Gunmetal, Carbon and Stainless Steel these units are also available in exotic materials such as Hastelloy, Duplex and Super Duplex.

The illustrations opposite show examples of specially designed, custom built indicators produced in conjunction with major engineering and construction service providers for international projects in locations including Malaysia, China and Thailand.

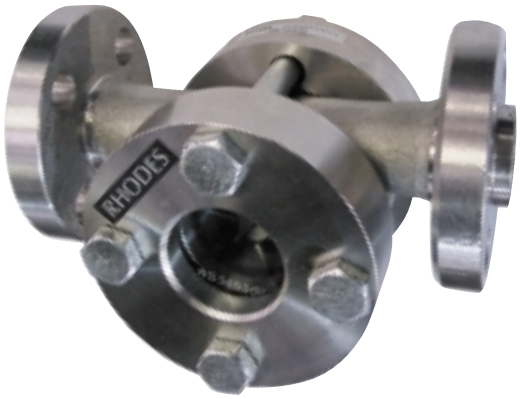
Variations of bespoke units previously produced include:

- Flushing Ports
- RTJ Flanges
- Profiled Backing Plates

All specific customer requirements will be considered or, if preferred, a solution can be provided by our experienced Technical Sales team given a set of required criteria.

Please contact our technical department for details:
tel: +44 (0)1744 453 688,
email: enquiry@deltafluidproducts.com

150mm Fig 408 with 25mm Flushing Ports



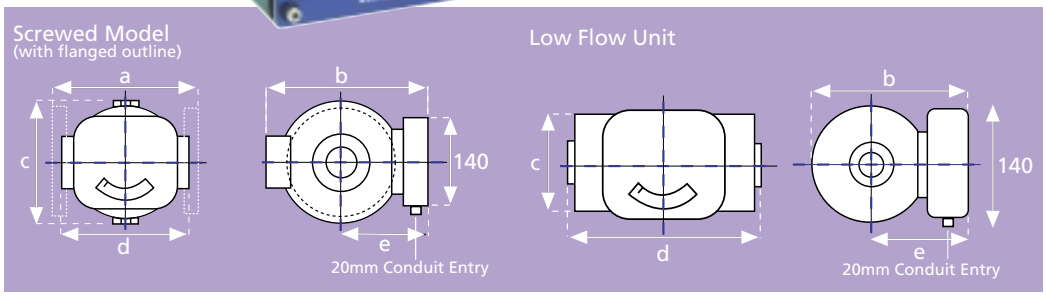
25mm Fig 408 with 1500 RTJ Flanges

flow~mon

Flow Rate Indicators with Switches

These units are manufactured in a wide range of sizes and specification options but all have the same basic function. A dial and mechanical indicator continuously monitor the flow rate at any given time whilst electrical switches can be specified to signal when a particular level has been reached during increasing or decreasing flow rates. Switches are field adjustable over the full range.

Where batching, trending, totalising or recording is required, all Rhodes Flow-Mon units can be supplied with a O-10V or 4-20mA output. All sizes are manufactured to the same simple design concept, the main characteristic of which ensures that the pressure drops are confined to an absolute minimum (see 'pressure drop' charts) across the vane orifice at full flow, with viscosities as high as 600cS. Sizes are defined by pipe size and/or maximum flow capacity, and every flow switch is individually calibrated so that full scale deflection is used in each application i.e. the maximum scale reading coincides with the maximum requirement of system as specified by the customer. Calibration may be in any units with single or dual scale to specification.



L/min	Pipe Size	Overall Dimensions (mm) a	b	c	d	e	Approximate Weight (kg) al	b	ci	s-ss	pvc
0 - 5 (Low Flow Unit)	¼ - 1"	n/a	155	100	188	110	3	8	-	8	3
0 - 70	¼ - 1"	160	145	80	130	105	1	2	2	2	1
0 - 500	¾ - 2"	180	200	120	140	110	3	7	7	7	3
0 - 1000	3"	255	320	250	305*	160	20	54	45	60	15
0 - 1500	4"	255	320	250	305*	160	22	60	52	70	17
0 - 3000	6"	460	500	370	510*	280	60	188	150	225	n/a
0 - 4500	8"	485	500	370	535*	280	68	205	164	246	n/a

flow~mon

Variable Orifice / Swing Vane Principle.

The flow switch body houses a spring-loaded valve plate (vane) that pivots off-centre in a hemispherical cavity. Thus the vane and cavity have a variable area orifice relationship. This gives both a high flow range and a linear relationship between flow rate and vane displacement. The vane indirectly operates both the indicating needle and an adjustable cam, which in turn triggers the micro-switch at any chosen setting of flow rate. Two switches can be supplied to provide high and low (or 'low-low') flow switching.

Principal Features and Benefits.

- All metal construction - no tubes of glass or plastic to break.
- Spring loaded mechanical design - requires no straight pipe run and not affected by orientation.
- Limited movement on internal parts - minimal wear and down time.
- Modular design - reduces maintenance costs, down time and production loss.
- Direct indication and field adjustable switch(es) - monitors critical flows and provides alarm(s).
- 1% of rate repeatable switch set point - accurate and reliable through all operation cycles.
- Weatherproof enclosure box to IP65(Nema4).
- Flow through design - minimal pressure loss.
- Individually calibrated to customer specification - ensures accuracy.
- Adjustable under operating conditions.
- Scale is in units (e.g. litres/minute).
- Large range of body materials available.
- Size range from 8mm (¼") to 200mm (8").
- May be installed in any position.
- Orientation of enclosure box easily changed.
- High switch rating - 15 Amps.
- ATEX approved Explosion-proof models available.
- Will pass twice the maximum indicated flow.
- Acts as non-return valve.

Applications

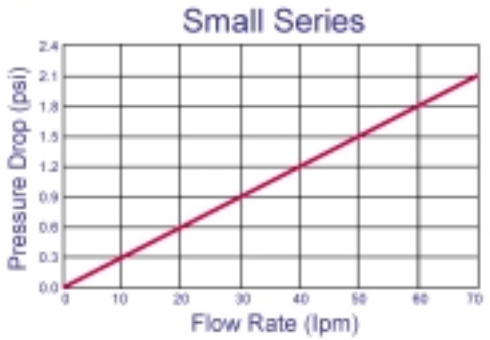
- Water (clean or dirty)
- De-ionised Water
- De-mineralised Water
- Petroleum Based Oils
- Synthetic Based Oils
- Solvents
- Corrosive Fluids
- Coolants
- Paints
- Air and Gases

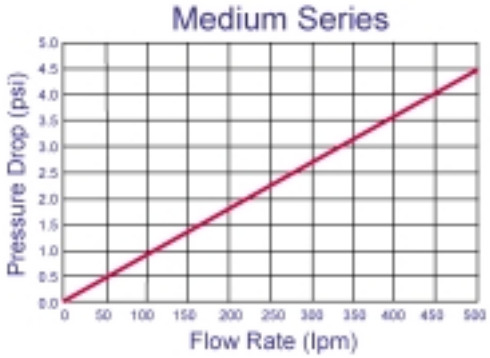
Low Flow Piston / Style Principle.

A fixed tapered needle passing through an orifice in the face of a piston, completely seals the port to port connection when the piston is seated. As flow commences the piston is displaced against a 4psi differential spring and moves over the tapered section of the needle, thus permitting flow through the orifice. Only the needle taper configuration needs to be changed to accommodate any specified viscosity and maximum flow requirement, thus the full deflection of the unit can be used for all applications.

Principal Features and Benefits.

- Suitable for liquid or gas applications
- Measures down to 200 cc/min (at 1cS)
- Measures down to 50 cc/min (at 20cS or higher)
- Maximum Capacity 5 litres/min
- Electric switch(es) and / or calibrated indication
- 4-20mA and O - 10v outputs available
- Cannot be switched on cold start-up
- Suitable for 20 bar or 140 bar maximum pressures
- Inline design, ¼" to 1: BSP or NPT female inlet and outlet
- Can be mounted in any orientation





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