

Non Ferrous Aircraft Fueling Meters

Bulletin SS01009 Issue/Rev. 0.4 (5/18)

Smith Meter® Rotary Vane PD Meters

The **Smith Meter® Aircraft Refueling Meters** are non ferrous, single case, rotary vane type positive displacement meters. They are available with a straight-through or an angle flow path, and with Victaulic, NPT, or Class 125 ANSI B16.1 flat-face flanges. Applications include: refuelers, defuelers, truck loading and accountability of other aircraft fuel transfers.

Features

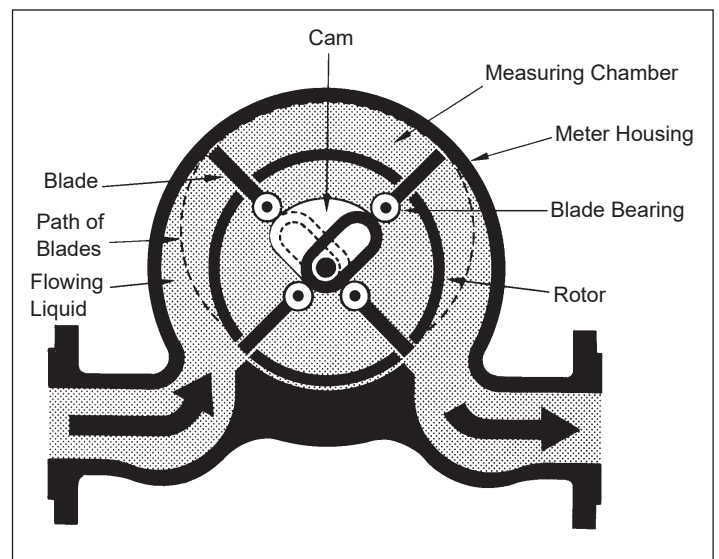
- **Superior Accuracy** – The Smith Meter® rotary vane meter principle minimizes pressure drop across the measuring chamber, which reduces flow through meter clearances to maximize accuracy.
- **Low Pressure Drop** – Streamlined flow path provides low pressure drop.
- **Positive and Accurate Registration** – High torque drive calibrator with adjustment in 0.05% increments ensures accurate registration.
- **Long Service Life** – Low friction ball bearings, fixed cam-type timing, and rugged construction give sustained accuracy and long service life.

Principle of Operation

The rotor, which revolves on stainless steel bearings, has four evenly-spaced slots. The slots control the position of two blades that are at right angles to each other. As liquid flows through the meter, the rotor and blades revolve around a fixed cam. Ball bearings fixed to the blades roll around the cam, causing the blades to move radially. The successive movement of the blades, outward toward the case wall, forms a measuring chamber of precise volume between the blades, rotor, case wall, and the bottom of the case. Four measuring chambers are produced for each revolution of the rotor, continuously and uninterrupted. Neither the blades nor the rotor contact the stationary walls of the measuring chamber.



Models ASD, ASF and ASG (shown above)
Models T-11 and T-20 (not shown)
Models SD, SF, and SG (not shown)



Above is an illustration of a straight-through meter. Port location of angle meters do not change this basic principle of operation.

Materials of Construction

Body and Cover	Hard Anodized Aluminum
Block	Hard Anodized Aluminum
Rotor¹	Aluminum
Bearings	Stainless Steel
Shaft and Cam	Stainless Steel
Gears	(In contact with liquid) Stainless Steel
Blades	Hard Anodized Aluminum/Nylon Wear Strips
Bushings	Rulon (T-11, Bronze)
Optional T-11 and T-20:	
Companion Flanges	Aluminum or Manganese Bronze

Specifications

Repeatability

±0.02%

Temperature

Standard

-20°F to 150°F (-29°C to 65°C).

Optional

-40°F to 200°F (-40°C to 93°C). Consult factory.

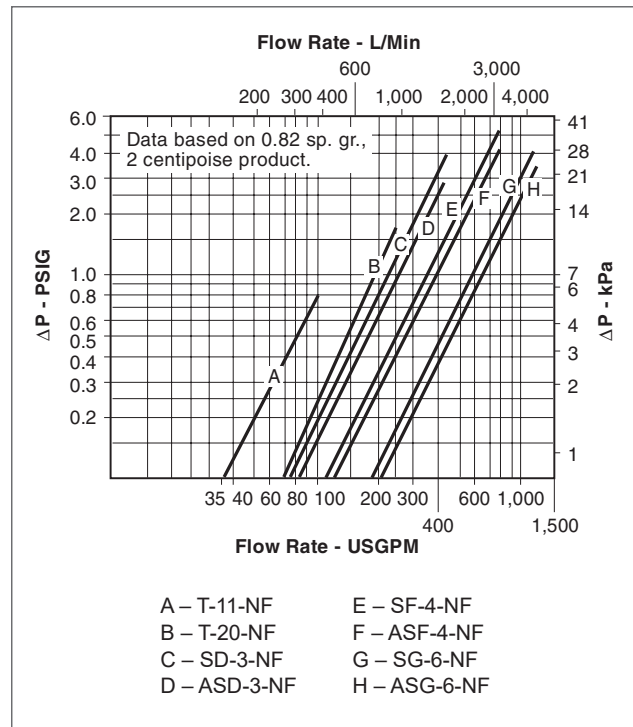
Maximum Working Pressure

All meters 150 psig (1,034 kPa)

Application

All meters, except T-11-NF, must be downstream of a fine mesh (e.g., 5 micron) strainer.

Pressure Drop (ΔP)



North American W&M Certifications

Consult Factory.

Maximum Flow Rate

Model	Connections	Maximum Flow Rate				Net Weight Lb (Kg.)
		USGPM	IGPM	L/min	m ³ /h	
T-11-NF (Angle Type)	2" Smith Meter® FF Studded Flanges ²	100	85	375	23	30 (14)
T-20-NF (Angle Type)	3" Smith Meter® FF Studded Flanges ²	250	210	950	57	45 (20)
SD or ASD-3-NF	3" Class 125 FF Flanges	420	350	1,600	95	75 (34)
SD or ASD-3V-NF	3" Victaulic Flanges	420	350	1,600	95	68 (31)
SD or ASD-4-NF	4" Class 125 FF Flanges	420	350	1,600	95	80 (36)
SD or ASD-4V-NF	4" Victaulic Flanges	420	350	1,600	95	70 (32)
SF or ASF-4-NF	4" Class 125 FF Flanges	800	650	3,000	180	115 (52)
SF or ASF-4V-NF	4" Victaulic Flanges	800	650	3,000	180	105 (48)
SF or ASF-6-NF	6" Class 125 FF Flanges	800	650	3,000	180	120 (54)
SF or ASF-6V-NF	6" Victaulic Flanges	800	650	3,000	180	108 (49)
SG or ASG-6-NF	6" Class 125 FF Flanges	1,200	1,000	4,600	270	160 (73)
SG or ASG-6V-NF	6" Victaulic Flanges	1,200	1,000	4,600	270	148 (67)

¹ T-11 has Manganese Bronze Rotor.

² Threaded companion flanges available.

Modeling

Flow Path ³	A S F — 4V — R — NF	Non Ferrous Construction
Blank - Straight Through		
A - Angle		
Single Case ³		Calibrator
		Blank - Standard
		R - Bidirectional Type-G Calibrator
Rotor Size		Size/Connection
(T, D, F, or G)		11 - 2" Smith Meter® Square Studded Flange
		20 - 3" Smith Meter® Square Studded Flange
		3 - 3" Class 125 FF ANSI
		3V - 3" Victaulic
		4 - 4" Class 125 FF ANSI
		4V - 4" Victaulic
		6 - 6" Class 125 FF ANSI
		6V - 6" Victaulic

Dimensions – Models T-11 and T-20

Inches (Millimeters)

Note: Dimensions – inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from respective engineering drawings.

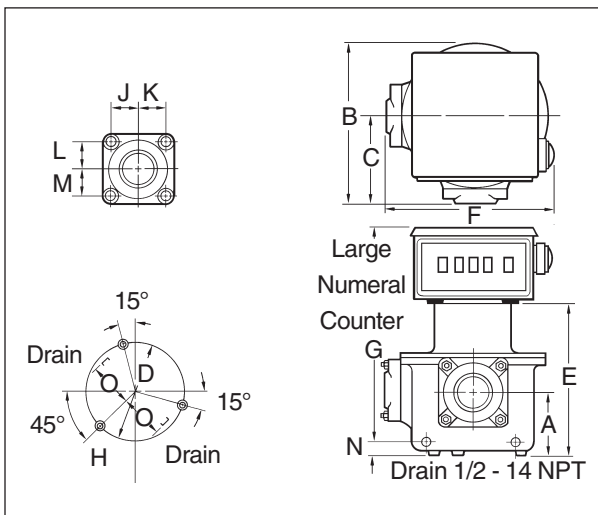


Figure 1 – T-11 and T-20

Figure	Model	Size	A	B	C	Anchor Bolt Circle D	E	F	G	Anchor Bolt Holes H	Flange Data					
											J	K	L	M	N	O
1	T-11-NF	2" NPT	4.1 (105)	10.3 (261)	5.6 (143)	6.6 (168)	10.8 (275)	12.2 (310)	16.8 (425)	(3) .375-16 (9.5)	1.5 (38)	1.5 (38)	1.5 (38)	1.5 (38)	.8 (21)	.4 (102)
												Removable, Threaded for 2" Pipe				
1	T-20-NF	3" NPT	4.7 (119)	12.5 (318)	7.0 (178)	8.5 (216)	11.9 (302)	13.6 (345)	17.8 (452)	(3) .375-16 (9.5)	2 (51)	2 (51)	2 (51)	2 (51)	.8 (21)	4.8 (121)
												Removable, Threaded for 3" Pipe				

³ Designation not applicable to Models T-11 and T-20.

Dimensions – Models SD, SF, and SG

Inches (Millimeters)

Note: Dimensions – inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from respective engineering drawings.

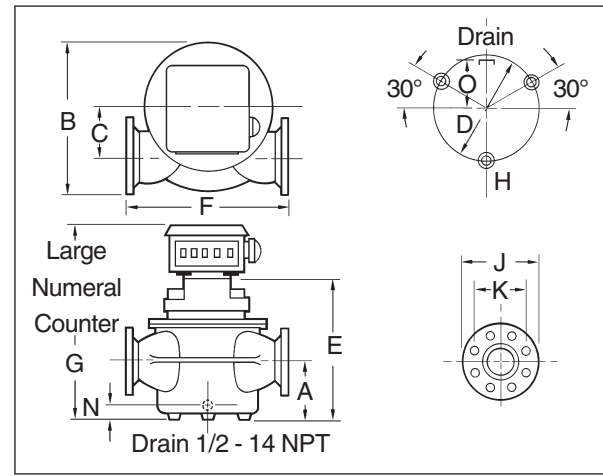


Figure 2 – Models SD, SF, and SG

Figure	Model	Size	A	B	C	Anchor Bolt Circle Dia. D	E	F	G	Anchor Bolt Holes H	Flange Data				N	O
											J	K	L	M		
2	SD3-NF	3"	4.9 (124)	14.2 (360)	4.4 (113)	8.1 (206)	14.0 (356)	15.5 (394)	19.9 (506)	(3) .375-16 (9.5)	7.5 (191)	6 (152)	No. of Holes & Dia. (4) .75 (19)	Bolt Dia. .625 (16)	.9 (22)	5.2 (133)
	SD3V-NF	3"	4.9 (124)	13.4 (340)	4.4 (113)	8.1 (206)	14.0 (356)	15.5 (394)	19.9 (506)	(3) .375-16 (9.5)	3.5 (89)	—	—	—	.9 (22)	5.2 (133)
	SD4-NF	4"	4.9 (124)	14.9 (379)	4.4 (113)	8.1 (206)	14.0 (356)	15.5 (394)	19.9 (506)	(3) .375-16 (9.5)	9.0 (229)	7.5 (191)	(8) .75 (19)	.625 (16)	.9 (22)	5.2 (133)
	SD4V-NF	4"	4.9 (124)	13.4 (340)	4.4 (113)	8.1 (206)	14.0 (356)	15.5 (394)	19.9 (506)	(3) .375-16 (9.5)	4.5 (114)	—	—	—	.9 (22)	5.2 (133)
	SD3R-NF	3"	4.9 (124)	14.2 (360)	4.4 (113)	8.1 (206)	14.3 (364)	15.5 (394)	20.2 (514)	(3) .375-16 (9.5)	7.5 (191)	6.0 (152)	(4) .75 (19)	.625 (16)	.9 (22)	5.2 (133)
	SD3VR-NF	3"	4.9 (124)	13.4 (340)	4.4 (113)	8.1 (206)	14.3 (364)	15.5 (394)	20.2 (514)	(3) .375-16 (9.5)	3.5 (89)	—	—	—	.9 (22)	5.2 (133)
	SD4R-NF	4"	4.9 (124)	14.9 (379)	4.4 (113)	8.1 (206)	14.3 (364)	15.5 (394)	20.2 (514)	(3) .375-16 (9.5)	9.0 (229)	7.5 (191)	(8) .75 (19)	.625 (16)	.9 (22)	5.2 (133)
	SD4VR-NF	4"	4.9 (124)	13.4 (340)	4.4 (113)	8.1 (206)	14.3 (364)	15.5 (394)	20.2 (514)	(3) .375-16 (9.5)	4.5 (114)	—	—	—	.9 (22)	5.2 (133)
	SF4-NF	4"	7.6 (193)	17.5 (445)	8.5 (140)	11.2 (286)	17.7 (449)	20.0 (508)	23.4 (600)	(3) .625-11 (16)	9.0 (229)	7.5 (191)	(8) .75 (19)	.625 (16)	1.8 (44)	4.7 (119)
	SF4V-NF	4"	17.6 (447)	16.5 (419)	5.5 (140)	11.2 (286)	17.7 (449)	20.0 (508)	23.6 (600)	(3) .625-11 (16)	4.5 (114)	—	—	—	1.8 (44)	4.7 (119)
	SF6-NF	6"	7.6 (193)	18.5 (470)	5.5 (140)	11.2 (286)	17.7 (449)	20.0 (508)	23.6 (600)	(3) .625-11 (16)	11.0 (279)	9.5 (241)	(8) .875 (22)	.75 (19)	1.8 (44)	4.7 (119)
	SF6V-NF	6"	7.6 (193)	16.5 (419)	5.5 (140)	11.2 (286)	17.7 (449)	20.0 (508)	23.6 (600)	(3) .625-11 (16)	6.6 (168)	—	—	—	1.8 (44)	4.7 (119)
	SF4R-NF	4"	7.6 (193)	17.5 (445)	5.5 (140)	11.2 (286)	18.0 (457)	20.0 (508)	23.9 (608)	(3) .625-11 (16)	9.0 (229)	7.5 (191)	(8) .75 (19)	.625 (16)	1.8 (44)	4.7 (119)
	SF4RV-NF	4"	7.6 (193)	16.5 (419)	5.5 (140)	11.2 (286)	18.0 (457)	20.0 (508)	23.9 (608)	(3) .625-11 (16)	4.5 (114)	—	—	—	1.8 (44)	4.7 (119)
	SF6R-NF	6"	7.6 (193)	18.5 (470)	5.5 (140)	11.2 (286)	18.0 (457)	20.0 (508)	23.9 (608)	(3) .625-11 (16)	11.0 (279)	9.5 (241)	(8) .875 (22)	.75 (19)	1.8 (44)	4.7 (119)
	SF6VR-NF	6"	7.6 (193)	16.5 (419)	5.5 (140)	11.2 (286)	18.0 (457)	20.0 (508)	23.9 (600)	(3) .625-11 (16)	6.625 (168)	—	—	—	1.8 (44)	4.7 (119)
	SG6-NF	6"	9.2 (235)	20.1 (510)	5.8 (148)	12.8 (324)	20.4 (519)	23.0 (584)	26.4 (670)	(3) .75-10 (19)	11.0 (279)	9.5 (241)	(8) .875 (22)	.75 (19)	2.4 (60)	5.4 (138)
	SG6V-NF	6"	9.2 (235)	19.8 (502)	5.8 (148)	12.8 (324)	20.4 (519)	23.0 (584)	26.4 (670)	(3) .75-10 (19)	6.625 (168)	—	—	—	2.4 (60)	5.4 (138)
SG6R-NF	6"	9.2 (235)	20.1 (510)	5.8 (148)	12.8 (324)	20.8 (527)	23.0 (584)	26.7 (678)	(3) .75-10 (19)	11.0 (279)	9.5 (241)	(8) .875 (22)	.75 (19)	2.4 (60)	5.4 (138)	
SG6VR-NF	6"	9.2 (235)	19.8 (502)	5.8	12.8 (324)	20.8 (527)	23.0 (584)	26.7 (678)	(3) .75-10 (19)	6.6 (168)	—	—	—	2.4 (60)	5.4 (138)	

Dimensions – Models ASD, ASF, and ASG

Inches (Millimeters)

Note: Dimensions – inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from respective engineering drawings.

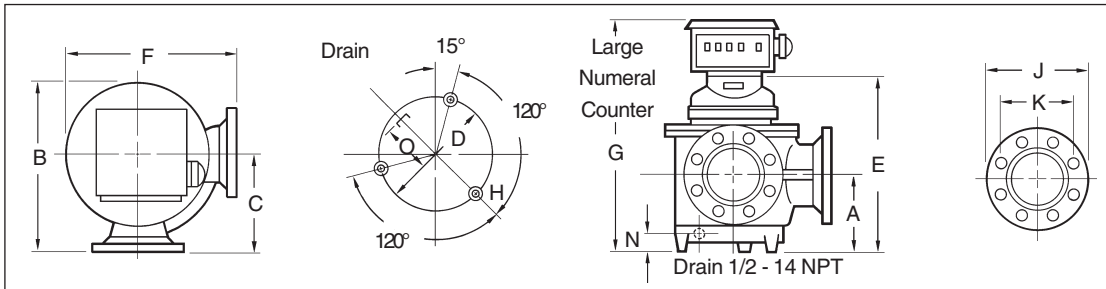


Figure 3 – Models ASD, ASF, and ASG

Figure	Model	Size	A	B	C	Anchor Bolt Circle D	E	F	G	Anchor Bolt Holes H	Flange Data				N	O
											J	K	L	M		
3	ASD-3-NF	3"	4.9 (124)	14.1 (359)	8.1 (206)	8.1 (206)	14.0 (356)	14.1 (359)	19.9 (506)	(3) .375-16 (9.5)	7.5 (191)	6.0 (152)	(4) .75 (19)	.625 (16)	.9 (22)	5.2 (133)
	ASD-3V-NF	3"	4.9 (124)	14.1 (359)	8.1 (206)	8.1 (206)	14.0 (356)	14.1 (359)	19.9 (506)	(3) .375-16 (9.5)	3.5 (89)	—	—	—	.9 (22)	5.2 (133)
	ASD-4-NF	4"	4.9 (124)	14.1 (359)	8.1 (206)	8.1 (206)	14.0 (356)	14.1 (359)	19.9 (506)	(3) .375-16 (9.5)	9.0 (229)	7.5 (191)	(8) .75 (19)	.625 (16)	.9 (22)	5.2 (133)
	AD-4V-NF	4"	4.9 (124)	14.1 (359)	8.1 (206)	8.1 (206)	14.0 (356)	14.1 (359)	19.9 (506)	(3) .375-16 (9.5)	4.5 (114)	—	—	—	.9 (22)	5.2 (133)
	ASD-3R-NF	3"	4.9 (124)	14.1 (359)	8.1 (206)	8.1 (206)	14.3 (364)	14.1 (359)	20.2 (514)	(3) .375-16 (9.5)	7.5 (191)	6.0 (152)	(4) .75 (19)	.625 (16)	.9 (22)	5.2 (133)
	ASD-3VR-NF	3"	4.9 (124)	14.1 (359)	8.1 (206)	8.1 (206)	14.3 (364)	14.1 (359)	20.2 (514)	(3) .375-16 (9.5)	3.5 (89)	—	—	—	.9 (22)	5.2 (133)
	ASD-4R-NF	4"	4.9 (124)	14.1 (359)	8.1 (206)	8.1 (206)	14.3 (364)	14.1 (359)	20.2 (514)	(3) .375-16 (9.5)	9 (229)	7.5 (191)	(8) .75 (19)	.625 (16)	.9 (22)	5.2 (133)
	ASD-4VR-NF	4"	4.9 (124)	14.1 (359)	8.1 (206)	8.1 (206)	14.3 (364)	14.1 (359)	20.2 (514)	(3) .375-16 (9.5)	4.5 (114)	—	—	—	.9 (22)	5.2 (133)
	ASF-4-NF	4"	7.6 (193)	17.5 (445)	10.5 (267)	11.2 (286)	17.7 (449)	17.5 (445)	23.6 (600)	(3) .625-11 (16)	9.0 (229)	7.5 (191)	(8) .75 (19)	.625 (16)	1.8 (44)	4.7 (119)
	ASF-4V-NF	4"	7.6 (193)	17.5 (445)	10.5 (267)	11.2 (286)	17.7 (449)	17.5 (445)	23.6 (600)	(3) .625-11 (16)	4.5 (114)	—	—	—	1.8 (44)	4.7 (119)
	ASF-6-NF	6"	7.6 (193)	17.5 (445)	10.5 (267)	11.2 (286)	17.7 (449)	17.5 (445)	23.6 (600)	(3) .625-11 (16)	11.0 (279)	9.0 (229)	(8) .875 (22)	.75 (19)	1.8 (44)	4.7 (119)
	ASF-6V-NF	6"	7.6 (193)	17.5 (445)	10.5 (267)	11.2 (286)	17.7 (449)	17.5 (445)	23.6 (600)	(3) .625-11 (16)	6.625 (168)	—	—	—	1.8 (44)	4.7 (119)
	ASF-4R-NF	4"	7.6 (193)	17.5 (445)	10.5 (267)	11.2 (286)	18.0 (457)	17.5 (445)	23.9 (608)	(3) .625-11 (16)	9.0 (229)	7.5 (191)	(8) .75 (19)	.625 (16)	1.8 (44)	4.7 (119)
	ASF-4VR-NF	4"	7.6 (193)	17.5 (445)	10.5 (267)	11.2 (286)	18.0 (457)	17.5 (445)	23.9 (608)	(3) .625-11 (16)	4.5 (114)	—	—	—	1.8 (44)	4.7 (119)
	ASF-6R-NF	6"	7.6 (193)	17.5 (445)	10.5 (267)	11.2 (286)	18.0 (457)	17.5 (445)	23.9 (608)	(3) .625-11 (16)	11.0 (279)	9.0 (229)	(8) .875 (22)	.75 (19)	1.8 (44)	4.7 (119)
	ASF-6VR-NF	6"	7.6 (193)	17.5 (445)	10.5 (267)	11.2 (286)	18.0 (457)	17.5 (445)	23.9 (608)	(3) .625-11 (16)	6.625 (168)	—	—	—	1.8 (44)	4.7 (119)
	ASG-6-NF	6"	9.2 (235)	20.2 (514)	11.5 (292)	12.8 (324)	20.4 (519)	20.2 (514)	26.4 (670)	(3) .75-10 (19)	11.0 (279)	9.0 (229)	(8) .875 (22)	.75 (19)	2.4 (60)	5.4 (138)
	ASG-6V-NF	6"	9.2 (235)	20.2 (514)	11.5 (292)	12.8 (324)	20.4 (519)	20.2 (514)	26.4 (670)	(3) .75-10 (19)	6.625 (168)	—	—	—	2.4 (60)	5.4 (138)
	ASG-6R-NF	6"	9.2 (235)	20.2 (514)	11.5 (292)	12.8 (324)	20.8 (527)	20.2 (514)	26.7 (678)	(3) .75-10 (19)	11.0 (279)	9.0 (229)	(8) .875 (22)	.75 (19)	2.4 (60)	5.4 (138)
	ASG-6VR-NF	6"	9.2 (235)	20.2 (514)	11.5 (292)	12.8 (324)	20.8 (527)	20.2 (514)	26.7 (678)	(3) .75-10 (19)	6.625 (168)	—	—	—	2.4 (60)	5.4 (138)

Accessories

G-Type Reversing Calibrator

Allows bidirectional registration on mechanical counters (reference Bulletin [SS01035](#)).

ATC Mechanical Temperature Compensator⁴

Provides volume registration at a reference temperature (net volume). The compensator is factory set for a specific product's coefficient of expansion (reference Bulletin [SS01038](#)).

ATG Mechanical Temperature Compensator⁴

Provides bidirectional net volume registration and is field adjustable for different products (reference Bulletin [SS01037](#)).

⁴ Thermowell Adapter (316 SS) required with ATC or ATG Calibrators.

Revisions included in SS01009 Issue/Rev. 0.4 (5/18):

New company branding.

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.