

Variable Area Flowmeters Armored Purgemeter

10A3200

■ Function

- The armored variable area flowmeter offers new possibilities for metering small flowrates of liquids and gases. The instrument is particularly well suited for metering cloudy, opaque or aggressive fluids.

■ Applications

- The instrument can be installed in Chemical, Petrochemical Industries, gas analyzers, process systems, well systems and wherever glass meter tubes cannot be used for safety reasons.

■ Essential Features

- Measures ranges from 0.26 to 800 GPH water or 1.7 to 3300 SCFH air.
- Easy to read percent or direct reading scale.
- Integral needle valve in the inlet or outlet (10A3220).
- Single and/or dual alarms
- Analog output signal 4-20 mA (10A3250/55)
- Differential pressure regulator (10A3220)
- Installation length only 90 mm (10A3220)
- Optional stainless steel indicator housing.



Armored Purgemeter
Series 10A3200

Specifications

The following design options are available:

Model	Connections	Max. Flow Range (H ₂ O) l/h
10A3220 10A3250	Horizontal ¼" NPT	≤ 100 l/h
10A3225/55	Vertical ¼" NPT	≤ 100 l/h
	Vertical 3/8" NPT	100 – 300 l/h
	Vertical ½" NPT	100 – 800 l/h
	Vertical 1" NPT	800 – 3000 l/h
	Vertical 1" G	800 – 3000 l/h

Flowrate Span: 1:10
For gas applications to 3200 l/h air flow range less than 1:10

Scale Design: Percent or direct reading scale

Scale Length: 60 mm (quarter circle)

Accuracy: ±6% of full scale

Reproducibility: ±0.5% of max.

Protection Class: IP 64, NEMA 3

Max. allowable pressure
Model 10A3225/55 1450 psi (100 bar), optional 2900psi (200 bar)
Model 10A3220/50 580 psi (40 bar)
Model 10A3220 w/differential pressure regulator 200 psi (14 bar)

Materials

Fluid Wetted Parts:
Float, orifice/meter tube, O-rings, fittings
Stainless Steel 1 4571 [316 Ti]/PVDF/PTFE
O-ring Viton A or Buna N

Non-fluid Wetted Parts
Housing cover Polycarbonate or Stainless steel, with glass window
Base plate Anodized aluminum, stainless steel as an option
Cover cap Anodized aluminum stainless steel as an option

Weight
w/o DP regulator: 0.3 to 2.0 kg
with DP regulator: 1.6 kg

Temperature Specifications

Limits:		
O-rings	O-Ring Viton A	300°F (150°C)
	O-Ring Buna N	248°F (120°C)
	O-Ring Kalrez	285°F (140°C)
Meter tube holder	PVDF	212°F (100°C)
	TFE	500°F (260°C)
Alarm transmitter	Non-Ex-design	176°F (80°C) T4
	Ex-Design	113°F (45°C) T6
Angular converter	Ex-Design	122°F (50°C) T4
		104°F (40°C) T6

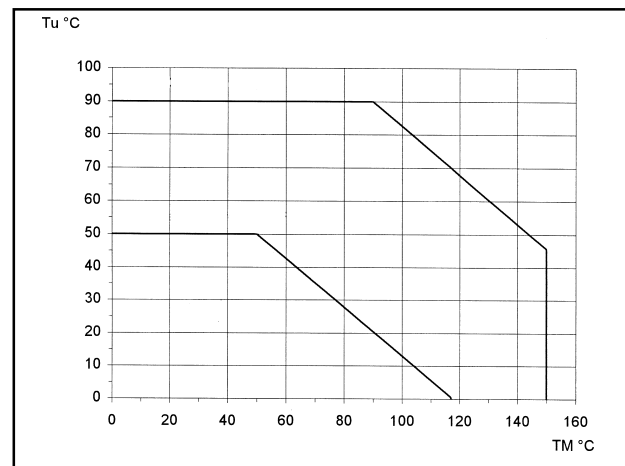


Fig.1: 10A3220/25 Non-Ex-Design (with/without Alarm Transmitter and Angular Converter)

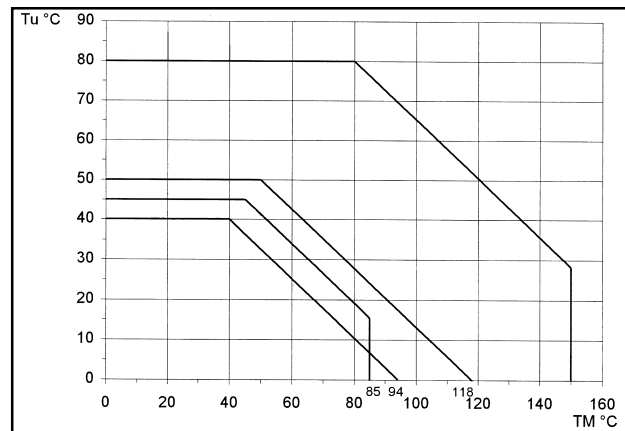


Fig.2: 10A3220/25 with Alarm Transmitter SJ 2, (EEx ia/ib IIC T4/T6, PTB No.: EX-83/2022) and Angular Converter OPF/Ex4, (EEx ib IIC T4/T6, 90C.980 14X)

T_A = Ambient temperature
 T_F = Fluid temperature

Specifications, Accessories

Alarm Transmitter, Model D10A3220/25

Alarm contacts can be installed in the housing, which respond at min. and/or max. flowrate. They can be used to switch the power to pumps, magnet valves, etc. on or off.

The alarm transmitter consists of a slot initiator and a switch amplifier. The switch amplifier is installed outside of the indicator housing. A control vane (4) initiates the switching procedure when it rotates into the slot initiator. The slot initiator can be positioned using a screw driver.

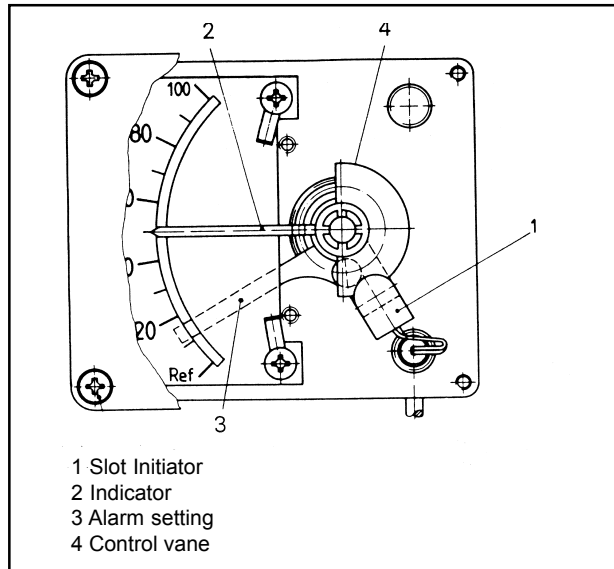


Fig. 3: Armored Purgemeter 10A3220 Indicator with Single Alarm

Alarm Transmitter

Slot Initiator Type SJ2-N (Pepperl & Fuchs)

Ambient Temperature

-20°C to +45°C

Certificate of Compliance

PTB 99 ATEX2219X; EEx ia IIc T6

Alarm Point Settings

Single alarm: min. 0 to 60%, max. 40 to 100%
Double alarm: min. range setting approx.5%

Setting Accuracy

±2% of max.

Switch Amplifier (remote)

Output

1 or 2 switch relays with potential free contacts

Power

max. 250 V, max. 2A

A Transmitter Power Supply is required for the Alarm Signal Output - Examples

Amplifier	Supply Power	Channel
KFA5-SR2-Ex1.W P/N 163A012U01	115 V, AC	1 SPDT
KFA6-SR2-Ex1.W P/N 163A012U05	220 V, AC	1 SPDT
KFA5-SR2-Ex1. W. LB P/N 163A012U03	115 V, AC	1 DPDT
KFA6-SR2-Ex1. W. LB P/N 163A012U04	220 V, AC	1 DPDT
KFA5-SR2-Ex2.W P/N 163A012U02	115 V, AC	2 SPDT
KFA6-SR2-Ex2.W P/N 163A012U06	220 V, AC	2 SPDT
KFD2-SR2-Ex1.W P/N D163A011U03	24 V, DC	1 SPDT
KFD2-SR2-Ex2.W P/N D163A011U06	24 V, DC	2 SPDT
KFD2-SR2-Ex1.W.LB P/N 163A012U07	24 V, DC	1 DPDT

These switch amplifiers are models manufactured by Pepperl & Fuchs. Others could be used equally as well.

Electronic Converter

Type: OPF Ex 4-2R/L.P. (Mfg'r. Tempress A/S)

Model 10A3250/55-Ex

The model 10A3250/55 flowmeters incorporate an angular converter. The converter is mounted on the pointer axis and converts the pointer position into a proportional 4-20 mA current value.

Output Signal 4-20 mA/-2-Wire

$U_{max} = 30 V$

$I_{max} = 30 mA$

$C_i \leq 50 nF$; $L_i \leq 360 \mu H$

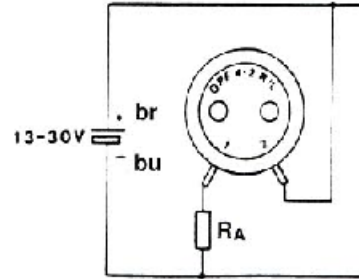
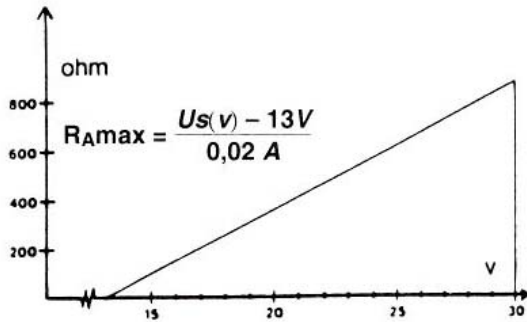
Ambient Temperature

-20°C to +40°C

Certificate of Compliance No.

DEMCO- No. 90C.98014X, EEX ib IIC T6

Indicator with Analog Output Signal 4-20 mA / 2 wire



Differential Pressure Regulator, Model 53RT2110, Model 10A3220

The differential pressure regulator when used in conjunction with the purgemeter maintains the flowrate set using the needle valve at a constant value.

Max. allow. Differential Pressure

100 psi (7 bar)

Connections

1/4" NPT

Materials

Housing

Stn. stl. 1.4571 [316Ti]

Diaphragm

Viton A (max. 150°C)*

O-Rings

Viton A*

Springs

Stn. Stl. 1.4401 [316]

Valve Seat and Shaft

Stn. stl. 1.4401 [316]

Connecting Piping

Stn. stl. 1.4401 [316]

Pipe Coupling

Stn. stl. 1.4401 [316]

*For Ammonia Buna N is required, max. 120°C

CAPACITY TABLE 1 Float & Metering Tube

Maximum Flow (1/4" NPT Vertical or Horizontal Connections)

Water		Air		Vstd [1]	Pdiff [2]	Pstat [3]	Pmin [4]	DP [5] Inches	Capacity Code
Sp. Gr. 1.0		1013 Mbar 0°C	14.7 Psia 70°F						
I/h	GPH	N I/h	SCFH	cps	psi	psig	psig	W.C.	.
1	0.26	35	1.7	4	10.2	14.5	-	3.2	01
1.6	0.42	54	2.4	4	10.2	14.5	-	3.2	02
2.5	0.66	100	3.6	6	10.2	14.5	-	3.2	03
4	1.05	160	5.8	6	10.2	14.5	-	3.2	04
6	1.6	230	8.2	18	10.2	14.5	-	3.2	05
10	26	350	12.5	18	10.2	14.5	-	3.2	06
16	4.2	540	19	18	10.2	14.5	-	3.2	07
25	6.6	850	30	18	10.2	14.5	-	3.6	08
40	10.5	1250	46	18	10.2	14.5	-	4.2	09
60	16	1900	70	18	10.2	14.5	-	5.0	10
100	26	3100	115	12	-	14.5	-	6.8	11

CAPACITY TABLE 2 Float & Orifice

Maximum Flow (Vertical Connections Only)

Connection Size	Water		Air		Vstd [1]	Pdiff [2]	Pstat [3]	Pmin [4]	DP [5] Inches	Capacity Code
	Sp. Gr. 1.0		1013 Mbar 0°C	14.7 Psia 70°F						
	I/h	GPH	N I/h	SCFH	cps	psi	psig	psig	W.C.	.
3/8"	100	26	3200	115	8	-	58	4.5	24	20
	160	42	5000	180	8	-	58	4.5	28	21
	200	52	6200	220	8	-	58	4.5	32	22
	250	66	7800	290	8	-	58	4.5	36	23
	300	78	9200	330	8	-	58	4.5	40	24
1/2"	400	105	12500	460	4	-	58	7.3	30	30
	500	135	15000	560	4	-	58	7.3	34	31
	600	160	18000	660	4	-	58	7.3	38	32
	700	190	21000	780	4	-	58	7.3	46	33
1"	800	210	24000	880	4	-	58	7.3	52	34
	I/h	GPM	N I/h	SCFM						
	800	3.5	24000	14.7	3	-	232	5.8	24	40
	1000	4.3	30000	18.3	3	-	232	5.8	25	41
	1600	7.0	48000	28.3	3	-	232	5.8	30	42
	2000	9.0	60000	36.7	3	-	232	5.8	34	43
	2500	11.0	74000	45.0	3	-	232	5.8	42	44
	3000	13.3	89000	55.0	3	-	232	5.8	52	45

- [1] Vstd: Allowable viscosity without calibration.
 [2] Pdiff: Min. required ΔP in psi if operating with differential pressure regulator. "-" not available.
 [3] Pstat: Min. required pressure in psig to eliminate float bounce, without using twisted guide rod float.
 [4] Pmin: Min. required pressure in psig with gas damping (twisted rod). "-" not available.
 [5] ΔP : Total pressure loss at maximum flow.

Dimensions 10A3220/25

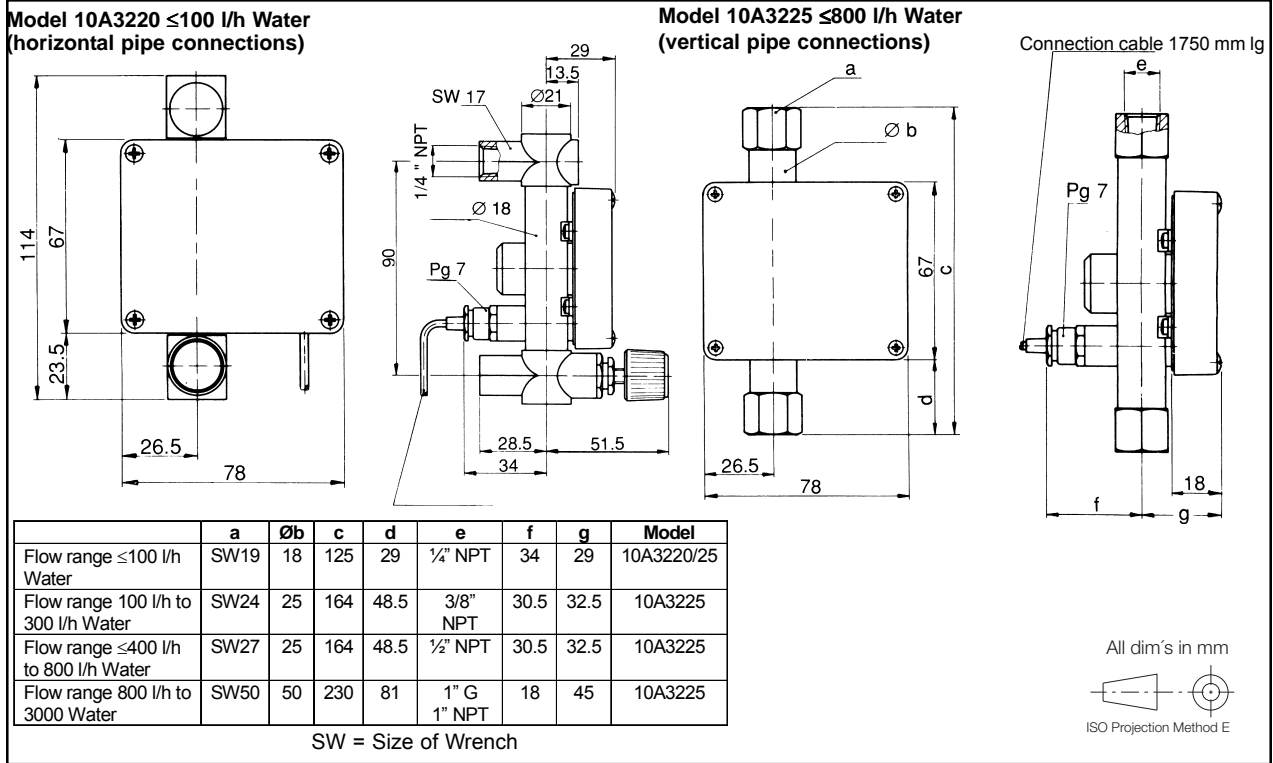


Fig. 4: Model 10A3220, 25 to 800 l/h Water

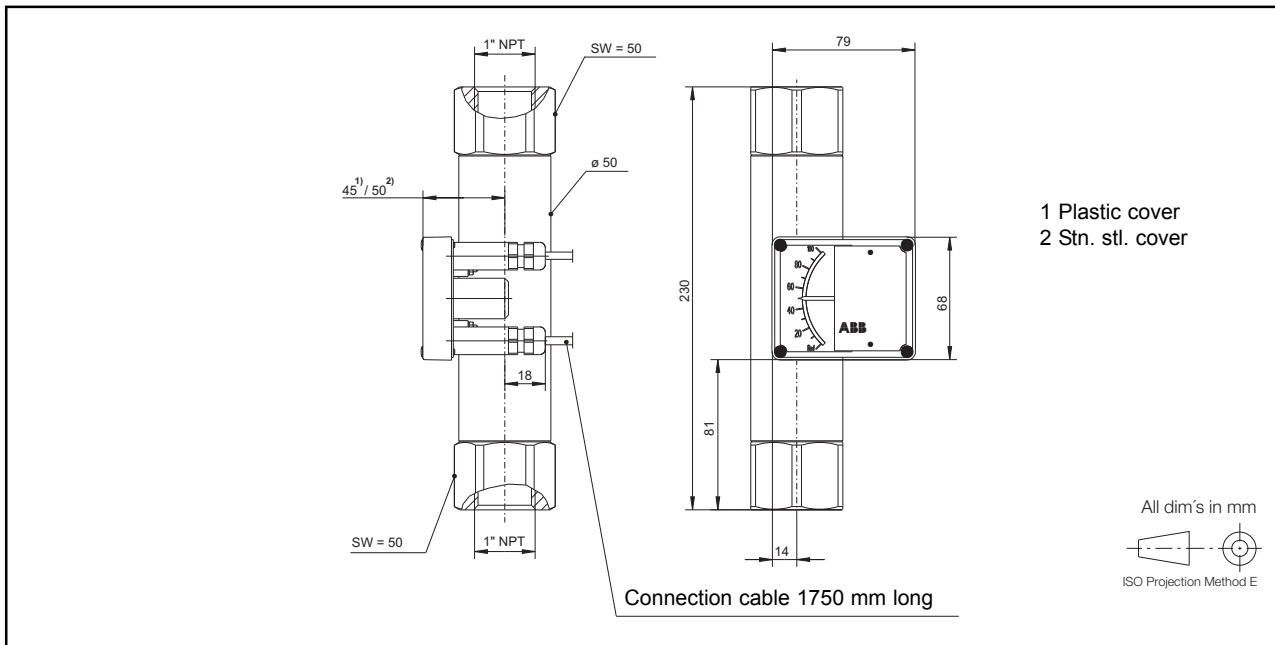


Fig. 5: Model 10A3225, 800 to 3000 l/h Water

Dimensions 10A3250/55

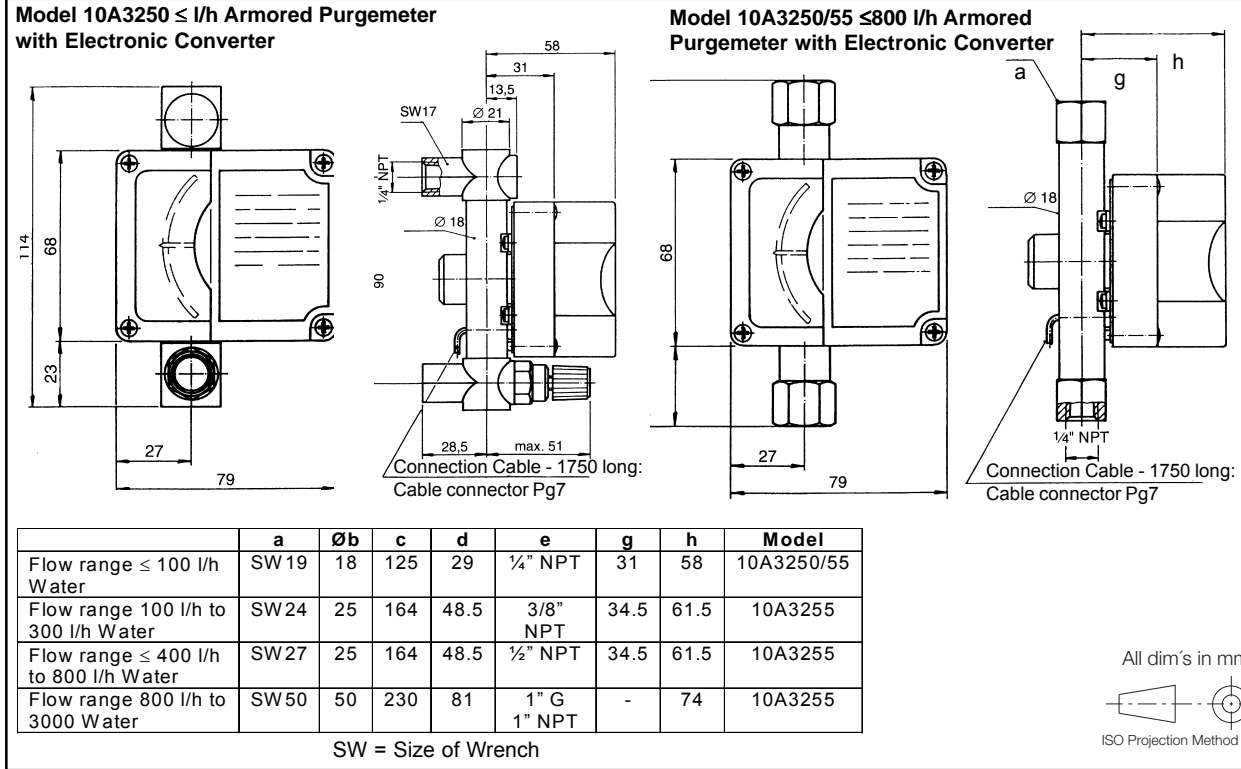


Fig. 6: Model 10A3250, 25 to 800 l/h Water

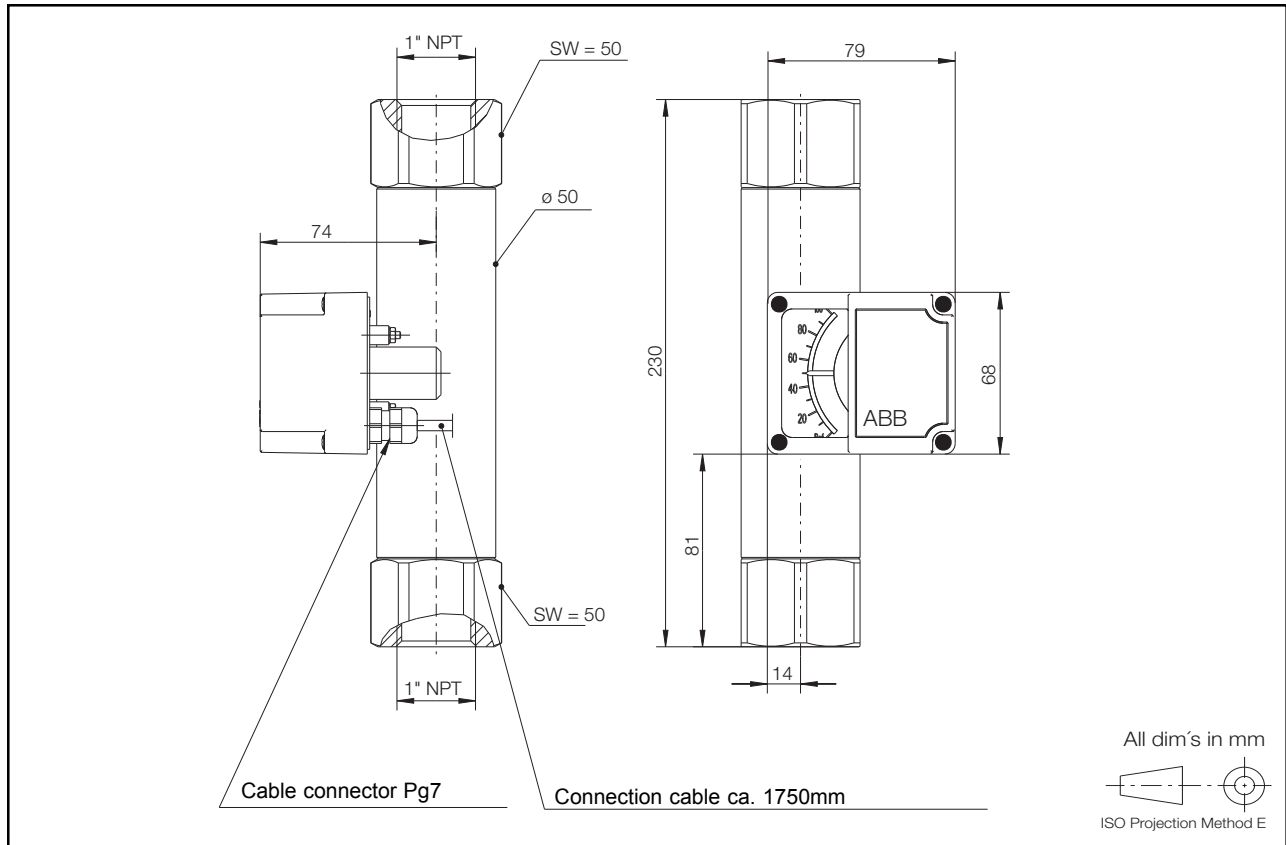


Fig.7: Model 10A3255, 800 to 3000 l/h Water

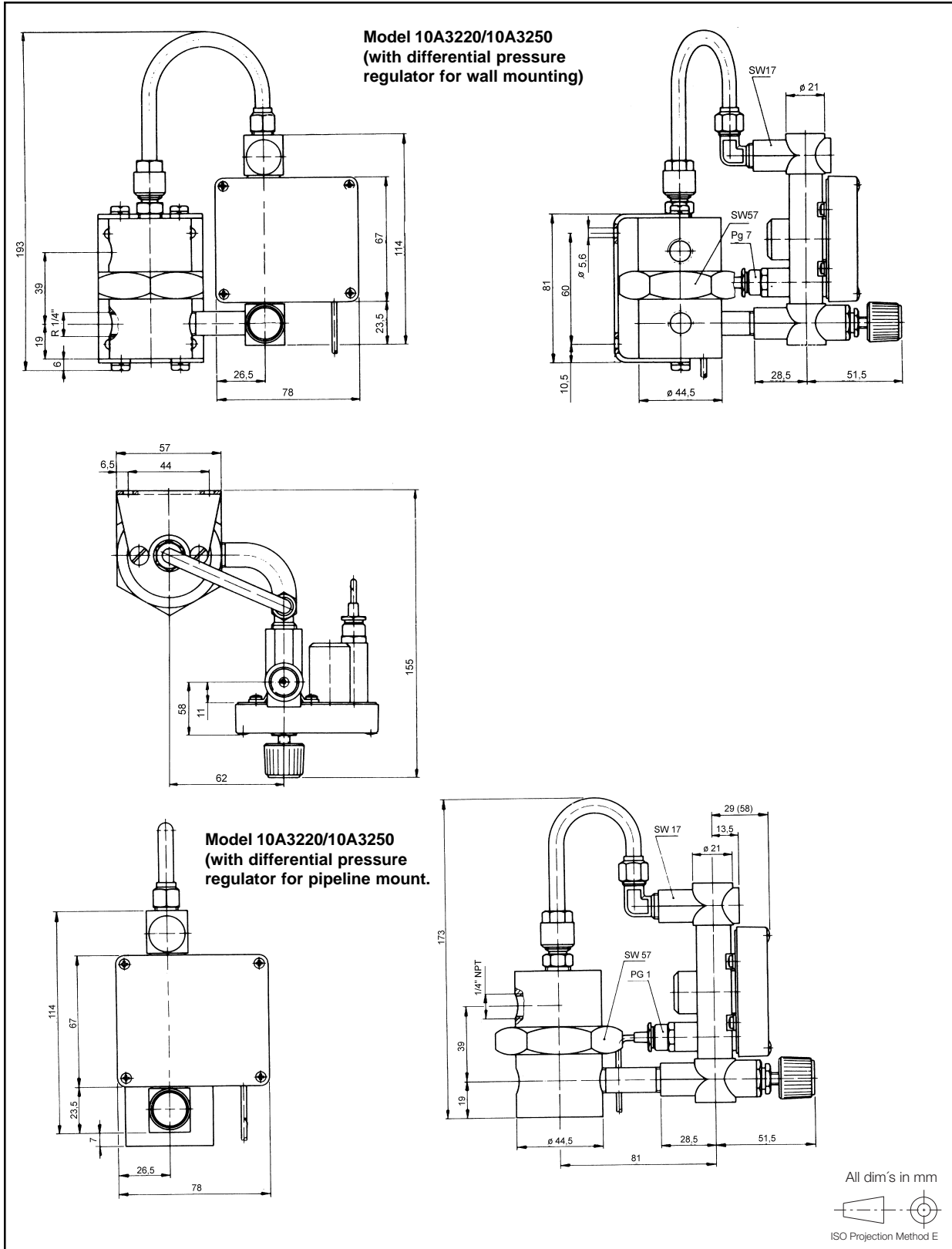
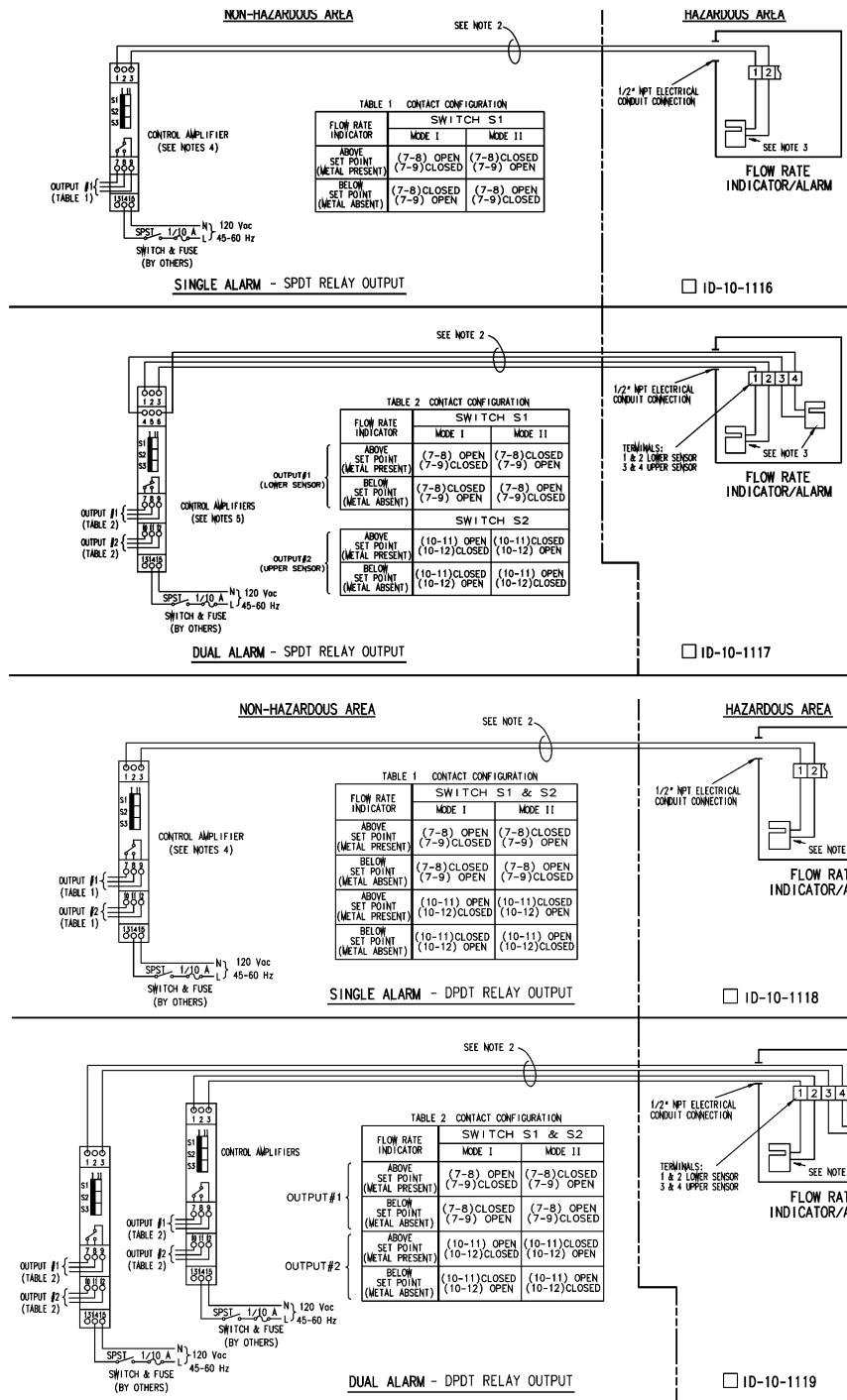


Fig. 8:



Notes:

- For intrinsically safe installations, all wiring to be in accordance with ANSI/ISA RP12.6.
- for intrinsically safe transmitter installations using one (1) sensor.
 - for non-hazardous or Div 2 transmitter installations using (2) sensors. Field wiring between flowmeter and control amplifier(s) should be twisted pair, 25 awg or larger. Maximum cable length per Table 1. All field wiring by others.
- for intrinsically safe transmitter installations using two (2) sensors. Field wiring between flowmeter and control amplifiers must be two (2) independent twisted pairs. 25 awg or larger. Maximum cable length per Table 1. All field wiring by others.
- Pepperl & Fuchs slot sensor SJ 3.5N.
- Pepperl & Fuchs control amplifier (relay) KFA5-SR2-Ex1.W (SPDT); KFA5-SR2-Ex1.W.LB (DPDT)
- Pepperl & Fuchs control amplifier (relay) KFA5-SR2-Ex2.W (SPDT)
- Contacts are unpowered and are rated at 2 A, 250V; relay contacts are shown de-energized. Relay contacts are not to be paralleled to increase contact rating.

Table 1 Cable Length

Transmitter Location	Maximum Length (Note 1)	
Non-Hazardous or Div 2	1 mi.	1.5 km
Class I, Div 1, Groups A & B	3000 ft.	900 m
Class I, Div 1, Groups C & D	1 mi.	1.5 km
Class II, Div 1, Groups E, F & G		

Cable Capacitance ≤ 60 pF/ft (197pF/m)
Inductance ≤ 0.2 μ H/ft (0.656 μ H/m)

Code

Armored Purge Meter

10A32

For quantity greater than 10 call

1 : Secondary

Indicator w/wo Alarm	2
Indicator w/Transmitter	5

2 : Construction

Horizontal Screw Connection (Only for 1/4 In. diameter tube)	0
Vertical Screw Connection	5

3 : Design Level

Design Level	D
--------------	---

4 : Integral Needle Valve Position (for 1/4 In. tubes only)

Without	(Note: 1)	A
Inlet Fitting, for 10A3220 Only	(Notes: 2, 3)	N
Outlet Fitting, for 10A3220 Only	(Notes: 2, 3)	M

5 : Material of Construction (Meter tube holders & O-rings)

PVDF (KYNAR) & Viton o-rings, 1/4 In.	1	
PVDF (KYNAR) & Buna N o-rings, 1/4 In.	2	
PTFE (TEFLON) & KALREZ o-rings, 1/4 In.	3	
PVDF(KYNAR) & KALREZ o-rings, 1/4 In.	Z	
Without & Viton o-rings - 3/8, 1/2, & 1 In.	(Notes: 4, 1)	4
Without & Buna N o-rings - 3/8, 1/2, & 1 In.	(Notes: 4, 1)	5
Without & KALREZ o-rings - 3/8, 1/2, & 1 In.	(Notes: 4, 1)	6

6 : Certifications

Without	A
Certificate of Conformance	B
Pressure Test	C
Material Certificate (EN 10204-3.1B) plus Pressure Test (AD-2000)	D
NACE MR0175 Compliance Certificate	Z

7 : Float Design

Standard float design	0	
Twisted guide rode float for gas service (sizes > 1/4 In. only)	(Note: 5)	1

8 : Indicator Housing Materials

Polycarbonate Cover, aluminum back (NA with transmitter)	(Note: 3)	A
Stainless Steel & Glass Cover, Stainless steel back (NA with transmitter)	(Note: 3)	E
Stainless Steel & Glass Cover, Stainless steel back (For transmitter option)	(Note: 6)	F

9 : Output Signal

Indicator w/o Output Signal	(Note: 3)	0
Indicator w/Minimum Alarm	(Note: 3)	1
Indicator w/Maximum Alarm	(Note: 3)	2
Indicator w/Minimum/Maximum Alarm	(Note: 3)	3
Indicator w/Analog-Output 4-20 mA/2-Wire	(Note: 6)	4

10 : Differential Pressure Regulator (with connection pipe)

Not Required	A	
53RT2110 of AISI 316 Stainless Steel (For Model 10A3220 1/4 In. diameter tube only)	(Notes: 2, 3, 7)	T

11 : Regulator Mounting

Pipe Mounting	1	
Wall Mounting (with Differential Pressure Regulator)	(Note: 8)	2

10A32

Code

12 : Connection Size

1/4 In. NPT (100 l/h or less)	(Note: 9)	A
3/8 In. NPT (100 to 300 l/h) (3/8 In. tube)	(Note: 10)	K
1/2 In. NPT (100 to 300 l/h) (3/8 In. tube)	(Note: 10)	M
1/2 In. NPT (400 to 800 l/h) (1/2 In. tube)	(Note: 10)	N
1 In. NPT (800 TO 3000 l/h) (1 In. tube)	(Note: 10)	P
1 In. G (800 to 3000 l/h) (1 In. tube)	(Note: 10)	Q

13 : Instrument Name Tag

Instrument Name Tag		1
---------------------	--	---

14 : External Alarm Relay

None		0
SPDT Single Alarm - 115 Vac	(Notes: 3, 11)	1
SPDT Dual Alarm - 115 Vac	(Notes: 3, 12)	2
DPDT Single (or Dual - requires 2 relays) Alarm - 115 Vac	(Notes: 3, 13)	3
SPDT Single Alarm - 220 Vac	(Notes: 3, 11)	4
SPDT Dual Alarm - 220 Vac	(Notes: 3, 12)	5
DPDT Single (or Dual requires 2 relays) Alarm - 220 Vac	(Notes: 3, 13)	6
SPDT Single Alarm - 24 Vdc	(Notes: 3, 11)	7
SPDT Dual Alarm - 24 Vdc	(Notes: 3, 12)	8
DPDT Single (or Dual - requires 2 relays) Alarm - 24 Vdc	(Notes: 3, 13)	9

15 : Flow Range

1/4 In. Diameter Tube 1 l/h	(Note: 14)	01
1/4 In. Diameter Tube 1.6 l/h	(Note: 14)	02
1/4 In. Diameter Tube 2.5 l/h	(Note: 14)	03
1/4 In. Diameter Tube 4 l/h	(Note: 14)	04
1/4 In. Diameter Tube 6 l/h	(Note: 14)	05
1/4 In. Diameter Tube 10 l/h	(Note: 14)	06
1/4 In. Diameter Tube 16 l/h	(Note: 14)	07
1/4 In. Diameter Tube 25 l/h	(Note: 14)	08
1/4 In. Diameter Tube 40 l/h	(Note: 14)	09
1/4 In. Diameter Tube 60 l/h	(Note: 14)	10
1/4 In. Diameter Tube 100 l/h	(Note: 14)	11
3/8 In. Diameter Tube 100 l/h	(Notes: 15, 1)	20
3/8 In. Diameter Tube 160 l/h	(Notes: 15, 1)	21
3/8 In. Diameter Tube 200 l/h	(Notes: 15, 1)	22
3/8 In. Diameter Tube 250 l/h	(Notes: 15, 1)	23
3/8 In. Diameter Tube 300 l/h	(Notes: 15, 1)	24
1/2 In. Diameter Tube 400 l/h	(Notes: 16, 1)	30
1/2 In. Diameter Tube 500 l/h	(Notes: 16, 1)	31
1/2 In. Diameter Tube 600 l/h	(Notes: 16, 1)	32
1/2 In. Diameter Tube 700 l/h	(Notes: 16, 1)	33
1/2 In. Diameter Tube 800 l/h	(Notes: 16, 1)	34
1 In. Diameter Tube 800 l/h	(Notes: 17, 1)	40
1 In. Diameter Tube 1000 l/h	(Notes: 17, 1)	41
1 In. Diameter Tube 1600 l/h	(Notes: 17, 1)	42
1 In. Diameter Tube 2000 l/h	(Notes: 17, 1)	43
1 In. Diameter Tube 2500 l/h	(Notes: 17, 1)	44
1 In. Diameter Tube 3000 l/h	(Notes: 17, 1)	45

16 : Scale Type

Linear , Liq/Gas Visc <1.4 CPS	(Note: 23)	1
Non Linear Liq Visc >1.4 CPS	(Note: 23)	4
Non Linear Liq Visc >1.4 CPS	(Note: 23)	5
Linear Gas	(Note: 23)	2
Linear Gas	(Note: 23)	3

10A32

Code

17: Scale Design

Direct Reading	D
Percent	P

18: Accuracy

Standard $\pm 6\%$ of maximum flow	B
Calibrated $\pm 3\%$ of Maximum Flow - includes Certificate of Calibration Gas Service	(Note: 18) C
Calibrated $\pm 3\%$ of Maximum Flow - includes Certificate of Calibration Liquids, viscosity under V.I.C.	(Note: 19) D
Calibrated $\pm 3\%$ of Maximum Flow - includes Certificate of Calibration Liquids, viscosity over V.I.C. & less than 100 ctk's	(Note: 19) E
Calibrated $\pm 3\%$ of Maximum Flow - includes Certificate of Calibration Liquids, viscosity over V.I.C. & greater than 100 ctk's	(Note: 20) F

Additional ordering information

19: External Needle Valve (316 sst) & Nipple (unassembled)

1/4 In. NPT; p/n 614C068U01	(Note: 14) V1
3/8 In. NPT; p/n 614C068U02	(Note: 21) V2
1/2 In. NPT; p/n 614C068U03	(Note: 22) V3
1 In. NPT; p/n 614C068U05	(Note: 17) V5

20: Preparation Procedure

Oxygen cleaning per ABB 3BUJ980096	P1
------------------------------------	----

21: Tags

Stainless steel tags (wired on) per meter	T1
---	----

- Note 1: Not available with Construction code 0
 Note 2: Not available with Construction code 5
 Note 3: Not available with Secondary code 5
 Note 4: Not available with Integral Needle Valve Position (for 1/4 In. tubes only) code M, N
 Note 5: Not available with Material of Construction (Meter tube holders & O-rings) code 1, 2, 3, Z
 Note 6: Not available with Secondary code 2
 Note 7: Not available with Integral Needle Valve Position (for 1/4 In. tubes only) code A
 Note 8: Not available with Differential Pressure Regulator (with connection pipe) code A
 Note 9: Not available with Material of Construction (Meter tube holders & O-rings) code 4, 5, 6
 Note 10: Not available with Material of Construction (Meter tube holders & O-rings) code 1, 2, 3
 Note 11: Not available with Output Signal code 0, 3, 4
 Note 12: Not available with Output Signal code 0, 1, 2, 4
 Note 13: Not available with Output Signal code 0, 4
 Note 14: Not available with Connection Size code K, M, N, P, Q
 Note 15: Not available with Connection Size code A, N, P, Q
 Note 16: Not available with Connection Size code A, K, M, P, Q
 Note 17: Not available with Connection Size code A, K, M, N
 Note 18: Not available with Scale Type code 1, 4, 5
 Note 19: Not available with Scale Type code 2, 3
 Note 20: Not available with Scale Type code 2, 3, 1
 Note 21: Not available with Connection Size code A, M, N, P, Q
 Note 22: Not available with Connection Size code A, K, P, Q
 Note 23: Refer to computer sizing program to select scale type code

NOTES:

NOTES:

ABB (www.abb.com) is a leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 120,000 people.

The Company's policy is one of continuous product improvement and the right is reserved to modify the information contained herein without notice.

Printed in USA (4.2.09)

© ABB 2003, 2009

www.abb.com/instrumentation



ABB Inc.
125 East County Line Road
Warminster
PA 18974
USA
Tel: +1 215 674 6000
Fax: +1 215 674 7183