

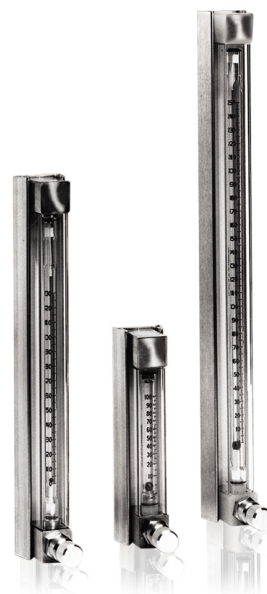
# Variable Area Flowmeter DATASHEET

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# Models A6100 & A6200 Purgemaster 'SNAP-IN' Small Flowmeter

Long-term reliable  
performance flowmeters with  
low cost-of-ownership



## High strength stainless steel body

- the body is corrosion resistant stainless steel, rigidly constructed to maintain tube alignment and resist pipe strain

## 'SNAP-IN' tube construction

- minimizes the downtime needed to clean the meter tube or to change the meter range

## Polycarbonate operator protection shield

- safety tested shield protects personnel from glass fragments in the rare event of accidental tube breakage

## Component flexibility

- all parts for the three scale lengths except bodies, tubes and protector shields are interchangeable

## Internal backcheck

- restricts back flow and draining of process fluid when metering tube is removed

## Choice of operating position

- the meter can be inverted and its tube reversed to change the control valve position from the inlet to the outlet

## Options of valve, DP regulator and alarms

## ATEX-approved versions available both with and without alarms

- II 2GD approval without alarms; II 2G approval with alarms

## Introduction

ABB Purgemaster Flowmeters are low capacity variable area flowmeters for both liquid and gas with an excellent selection of material and scale lengths in a single product family design. They provide optimum flexibility with a minimum number of components. The meter features a corrosion resistant, high strength stainless steel body, quick, easy snap-in tube construction and a safety tested operator protection shield.

ABB Purgemasters are ideal for applications such as the purging of control lines and instrument enclosures. Their use is easily extended into fluid sampling, liquid specific gravity, level measurement and similar services.

## Specification

### Measuring ranges

See measuring range tables on pages 3, 4 and 5

### Rangeability

≥10:1

### Scale design

% or direct reading scales

Dt/Df ratio scale, millimeters

### Accuracy classes (VDE/VDI 3513)

5 in. scale length

1/4 in. & 1/8 in. tube diameter 2.5

1/16 in. tube diameter 6

3 in. scale length

All sizes 10

1 1/2 in. scale length

All sizes 10

### Permissible operating temperatures

Non-certified systems

Stainless steel fittings 0 to 120 °C process

Brass fittings 0 to 95 °C process

ATEX Certified systems

	Max permissible Ambient or process temperature in deg C – whichever is the greater		
Option/Temp Class	T6	T5	T4
A6xxx without ring sensors	75	90	120
A6xxx with ring sensors	40	40	40

### Types of installation

In-line, front- & rear-panel-mounting

Wall-mounting (regulator only)

### Permissible operating pressures – kPa (bar)

Scale length (in.)	Material			
	Stainless steel		Brass	
	Fluid Temperature		Fluid Temperature	
	Max.	Design	Max.	Design
	120 °C (248 °F)	38 °C (100 °F)	95 °C (203 °F)	38 °C (100 °F)
1 1/2 to 3	1800 (18)	1800 (18)	1400 (14)	1800 (18)
5 to 10	1800 (18)	1800 (18)	1400 (14)	1800 (18)

### Materials

Wetted Parts	Standard	Options
Measuring Tube	Borosilicate glass	–
Float 1/16 in.	Glass (BG) Sapphire (SA) 316 Stainless Steel	Carboloy (CA) Tantalum (TA)
1/8 in.	Glass (BG) Sapphire (SA) 316 Stainless Steel	Carboloy (CA) Tantalum (TA)
1/4 in.	Glass (CD) 316 Stainless Steel	Sapphire (SA) Carboloy (CA) Tantalum (TA)
Float Stop 5 in. tube 3 1/2 in. tube	PTFE 316 Stainless Steel	316 Stainless Steel
Fittings	Brass 316 S31 Stainless Steel	
O-rings	Buna N Viton A	Ethylene propylene Kalrez
Tube Adapter	Brass 316 Stainless Steel	–
Needle Valve	316 S31 Stainless Steel	–
Return Ball	PTFE	316 Stainless Steel

### Other components

Body	304 Stainless Steel
Operator Protection Shield	Polycarbonate

### Connections

1/4 in. NPT or G1/4 internal thread, rear-facing horizontal or vertical

### Weights

	Without Regulator (kg)	With Regulator (kg)
Model A6131/41	0.45	1.6
Model A6132/42	0.65	1.8
Model A6133/43	0.80	2.0
Model A6134/44	0.45	1.6
Model A6135/45	0.45	1.6

## Measuring Range Tables

### Models A6131/41

Measuring Tube	Float	Water		Air 0 °C 1013 mbar (cm³/min) (Q <sub>n</sub> )		Min. diff. press. bar <sup>a</sup>	Alarm RC10 = 1 RC15 = 2	Measuring Tube/Float Combination <sup>c</sup>
Tube No.	Float No.	cm³/min	l/h	Q <sub>n</sub> (cm³/min)	Q <sub>n</sub> (l/h)			
FP-1/8-08-P-3/37	BG-18	0.4 to 4.4	0.02 to 0.26	20 to 360*	2 to 21	0.17	–	F1
	SA-18	0.5 to 8.5	0.04 to 0.5	20 to 500	2 to 30	0.18	–	F5
	SS-18	1 to 19*	0.1 to 1.1	50 to 850*	3 to 50	0.18	1	F6
	CA-18	2 to 34	0.1 to 2.0	50 to 1300	5 to 80	0.18	1	F2
FP-1/8-20-P-3/37	BG-18	2 to 28	0.1 to 1.7	100 to 1500	5 to 95*	0.21	–	F8
	SA-18	4 to 48*	0.2 to 2.9	200 to 2000	10 to 125	0.21	–	G1
	SS-18	5 to 90*	0.4 to 5.4*	200 to 3000*	10 to 180	0.21	1	G2
	CA-18	10 to 135	0.5 to 8.0	400 to 4000	20 to 260	0.21	1	F9
	TA-14	15 to 145	1 to 8.5	460 to 4600	27 to 270	0.21	–	H1
FP-1/4-15-P-3/37	CD-14	10 to 130	0.5 to 7.5	500 to 6500	20 to 380	0.35	–	N0
	SA-14	23 to 230	1.4 to 14	850 to 8500	52 to 520	0.35	–	N3
	SS-14	20 to 400	2 to 23.0	1000 to 12500	50 to 750	0.7	2	N6
	CA-14	40 to 580	2 to 34.0	1000 to 17000	100 to 1050	0.7	2	M3
FP-1/4-20-P-3/37	CD-14	20 to 220*	0.5 to 13.0*	500 to 9500	40 to 560	0.35	–	M4
	SA-14	40 to 400	2 to 22	1000 to 12500	70 to 750	0.35	–	M5
	SS-14	40 to 580*	2.0 to 34.0*	1000 to 18000	100 to 1100	0.7	2	M6
	CA-14	50 to 850	4 to 50.0	2000 to 25000	100 to 1500	0.7	2	N1
FP-1/4-41-G-3/37	CD-14	40 to 460	2 to 27.0	1000 to 19000	100 to 1150	0.7	–	N2
	SA-14	70 to 750	4 to 46	3000 to 27000	200 to 1600	0.7	–	N5
	SS-14	100 to 1200	5 to 75.0*	2000 to 38000	100 to 2300	0.7	2	N8
	CA-14 <sup>b</sup>	100 to 1800	10 to 105	4000 to 54000	200 to 3200	–	2	M9

#### Notes.

- a) Applies only with differential pressure regulator  
b) Not available with differential pressure regulator  
c) For ordering information only  
\* Direct reading scales as standard

### Models A6131/41 with Inductive Alarm Sensor (RC10/RC15)

Measuring Tube	Float	Water cm³/min	Air 0 °C 1013 mbar (cm³/min) (Q <sub>n</sub> )	Minimum Differential Pressure (bar) <sup>a</sup>	Ring Sensor
FP-1/8-08-P-3/37	SS-18	2 to 19	100 to 850	0.18	RC10-14-N3-Y115614
FP-1/8-20-P-3/37	SS-18	10 to 90	400 to 3200	0.21	
FP-1/4-15-P-3/37	SS-14	40 to 400	1000 to 12500	0.7	RC15-14-N3-Y115615
	CA-14	80 to 580	2000 to 17000	1.5	
FP-1/4-20-P-3/37	SS-14	80 to 580	2000 to 18000	0.7	
	CA-14	100 to 850	4000 to 25000	1.5	
FP-1/4-41-G-3/37	SS-14	150 to 1200	6000 to 40000	0.7	
	CA-14	200 to 1800	8000 to 54000	Note <sup>b</sup>	

#### Notes.

- a) In conjunction with differential pressure regulator  
b) Not available with differential pressure regulator

## Measuring Range Tables

### Models A6132/42

Measuring Tube Size	Measuring Tube No.	Float No.	Max. flow <sup>a</sup>		Alarm RC10 = 1 RC15 = 2	Float/ Measuring Tube Combination <sup>c</sup>
			Water cm <sup>3</sup> /min	Air 0 °C 1013 mbar (cm <sup>3</sup> /min) (Q <sub>n</sub> )		
1/16 in. <sup>b</sup>	FP-1/16-10-G-5/81	BG-16	0.53	48.1		B1
	12		0.92	80.0		B6
	16		1.61	131.1		C1
	20		2.45	192.5		C6
	FP-1/16-10-G-5/81	SA-16	1.05	73.2		B3
	12		1.58	117.0		B8
	16		3.2	188.6		C3
	20		4.82	270.1		C8
	FP-1/16-10-G-5/81	SS-16	2.46	136.0		B4
	12		4.2	203.5		B9
	16		7.2	319.2		C4
	20		10.3	430.5		C9
	FP-1/16-10-G-5/81	CA-16	4.71	217.9		B2
	12		7.6	307.1		B7
	16		12.3	475.3		C2
	20		17.8	636.2		C7
	FP-1/16-10-G-5/81	TA-16	5.25	234.2		B5
	12		8.4	326.7		C0
	16		13.5	508.5		C5
	20		18.6	678.0		D0
1/8 in.	FP-1/8-08-G-5/81	BG-18	6.1	373.6		H2
	12		13.9	696.3		H7
	16		22.6	1046.2		J2
	20		31.5	1426.6		J7
	25		43.7	1885.1		K2
	FP-1/8-08-G-5/81	SA-18	10.5	511.3		H4
	12		23.0	928.8		H0
	16		35.7	1384.7		J4
	20		48.5	1857.6		J9
	25		64.5	2454.0		K4
	FP-1/8-08-G-5/81	SS-18	20.5	804.4	1	H5
	12		39.5	1421.4	1	J0
	16		60.0	2092.8	1	J5
	20		81.0	2788.3	1	K0
	25		107.0	3629.1	1	K5
	FP-1/8-08-G-5/81	CA-18	33.6	1205.7	1	H3
	12		61.2	2089.4	1	H8
	16		90.6	3014.3	1	J3
	20		121.7	3997.8	1	J8
	25		159.7	5136.7	1	K3
	FP-1/8-08-G-5/81	TA-18	36.5	1287.9		H6
	12		66.0	2219.0		J1
	16		97.5	3202.4		J6
	20		130.0	4229.3		K1
	25		171.5	5456.3		L1
1/4 in.	FP-1/4-10-G-5/81	CD-14	78	3717		R4
	16		152	6742		S0
	20		206	8928		S6
	25		275	11479		T2
	FP-1/4-10-G-5/81	SA-14	134	5200		R5
	16		253	9245		S1
	20		337	12231		S7
	25		446	15650		T3
	FP-1/4-10-G-5/81	SS-14	228	7793	2	R6
	16		415	13672	2	S2
	20		547	17979	2	S8
	25		703	22900	2	T4
	FP-1/4-10-G-5/81	CA-14	346	10967	2	R3
	16		612	19227	2	R9
	20		805	25293	2	S5
	25		1036	32200	2	T1
	FP-1/4-10-G-5/81	TA-14	370	11704		R7
	16		660	20457		S3
	20		860	26703		S9
	25		1105	34276		T5
	FP-1/4-40-G-6/81	SS-14	1500	45700	2	V0
	FP-1/4-40-G-6/81	CA-14	2050	64800	2	T7
	FP-1/4-40-G-6/81	TA-14	2200	67200		W1

#### Notes.

a) Maximum flow rates for other fluids can be calculated using our sizing software – contact ABB

b) Not available with differential pressure regulator

c) For ordering information only

### Models A6132/42 with Inductive Alarm Sensor (RC10/RC15)

Measuring Tube	Float	Max. Flow		Minimum Differential Pressure (bar) <sup>a</sup>	Ring Sensor
		Water cm <sup>3</sup> /min	Air 0 °C 1013 mbar (cm <sup>3</sup> /min) (Q <sub>n</sub> )		
FP-1/8-08-G-5/81 12 16 20 25	SS-18	20.5 39.5 60.0 81.0 107.0	804.4 1421.4 2092.8 2788.3 3629.1	0.18	RC10-14-N3-Y115614
FP-1/4-10-G-5/81 16 20 25	SS-14	228 415 547 703	7793 13672 17979 22900	0.7	
FP-1/4-10-G-5/81 16 20 25	CA-14	346 612 805 1036	10967 19227 25293 32200	1.5	RC15-14-N3-Y115615
FP-1/4-40-G-6/281 40	SS-14 CA-14	1512 2180	48384 67580	0.7 <sup>b</sup>	

#### Notes.

- a) In conjunction with differential pressure regulator  
b) Not available with differential pressure regulator

### Models A6133/43

Measuring Tube	Float	Max. Flow			
		Water		Air 0 ° C 1013 mbar	
		cm <sup>3</sup> /min	l/h	cm <sup>3</sup> /min (Q <sub>n</sub> )	l/h
FP-1/8-077-G-10	SA-18	1 to 9.5	0.08 to 0.58	80 to 520	4 to 32
FP-1/8-13.3-G-10	BG-18	2 to 17	0.1 to 1.0	100 to 850	6 to 50
FP-1/8-077-G-10	SS-18	2 to 20	0.15 to 1.2	100 to 800	6 to 50
FP-1/8-13.3-G-10	SA-18	2 to 27	0.2 to 1.6	150 to 1100	10 to 65
FP-1/8-13.3-G-10	SS-18	6 to 48	0.2 to 2.9	200 to 1700	10 to 100
FP-1/4-10-G-10	BG-14	10 to 95	0.8 to 5.6	400 to 4200	20 to 250
FP-1/4-19-G-10	BG-14	20 to 230	1.5 to 13.5	1000 to 9000	80 to 560
FP-1/4-10-G-10	CA-14	40 to 360	2 to 22	1500 to 11500	100 to 700
FP-1/4-19-G-10	SS-14	80 to 540	4 to 32	2000 to 17000	150 to 1050
FP-1/4-40-G-10	BG-14	80 to 600	4 to 38	2000 to 26000	200 to 1600
FP-1/4-19-G-10	CA-14	100 to 800*	6 to 48	2000 to 24000	150 to 1450
FP-1/4-40-G-10	SS-14	150 to 1500*	10 to 90	6000 to 48000	200 to 2900
FP-1/4-40-G-10	CA-14	200 to 2200*	15 to 135	1000 to 70000	400 to 4000

\*Not available with differential pressure regulator

**Models A6133/43 with Inductive Alarm Sensor (RC10/RC15)**

Measuring Tube	Float	Max. Flow			
		Water		Air 0 ° C 1013 mbar	
		cm <sup>3</sup> /min	l/h	cm <sup>3</sup> /min (Qn)	l/h
FP-1/8-077-G-10	SS-18	2 to 20	0.15 to 1.2	100 to 800	6 to 50
FP-1/8-13.3-G-10	SS-18	6 to 48	0.2 to 2.9	200 to 1700	10 to 100
FP-1/4-10-G-10	CA-14	40 to 360	2 to 22	1500 to 11500	100 to 700
FP-1/4-19-G-10	SS-14	80 to 540	4 to 32	2000 to 17000	150 to 1050
FP-1/4-19-G-10	CA-14	100 to 800*	6 to 48	2000 to 24000	150 to 1450
FP-1/4-40-G-10	SS-14	150 to 1500*	10 to 90	6000 to 48000	200 to 2900
FP-1/4-40-G-10	CA-14	200 to 2200*	15 to 135	1000 to 70000	400 to 4000

\*Not available with differential pressure regulator

**Models A6134/44**

Measuring Tube <sup>b</sup>	Float No.	Water cm <sup>3</sup> /min	Air 0 ° C 1013 mbar (cm <sup>3</sup> /min) (Q <sub>n</sub> )	Min. Required Differential Press bar <sup>a</sup>	Float/ Measuring Tube Combination <sup>d</sup>
Tube No.					
FP-1/16-08-P-1 1/2/19	BG-16 °	0.05 to 0.8	5 to 65	–	A1
	SA-16 °	0.10 to 1.0	5 to 90	–	A2
	SS-16 °	0.50 to 4.0	15 to 170	–	A3
FP-1/16-30-P-1 1/2/19	BG-16	0.5 to 7.0	25 to 400	0.17	A4
	SA-16	1.0 to 13.0	50 to 550	0.17	A5
	SS-16	2.0 to 22.0	50 to 850	0.17	A6
FP-1/8-21-P-1 1/2/19	BG-18	2.5 to 37.5	100 to 2000	0.21	E1
	SA-18	5.0 to 60.0	200 to 2600	0.21	E3
	SS-18	10 to 120.0	200 to 3800	0.21	E4
	CA-18	14 to 180	280 to 5600	0.21	E2
FP-5/32-40-P-1 1/2/19	BG-5/32	15 to 190	700 to 8000	0.18	W2
	SS-5/32	40 to 450	1200 to 15000	0.18	W3
FP-1/4-28-P-1 1/2/19	SA-14	30 to 570	1300 to 19500	0.7	L2
	SS-14	50 to 850	2000 to 28000	0.7	L3
FP-1/4-41-P-1 1/2/19	SS-14 °	100 to 1600	2500 to 45000	–	M1
	CA-14 °	200 to 2200	5000 to 70000	–	L4

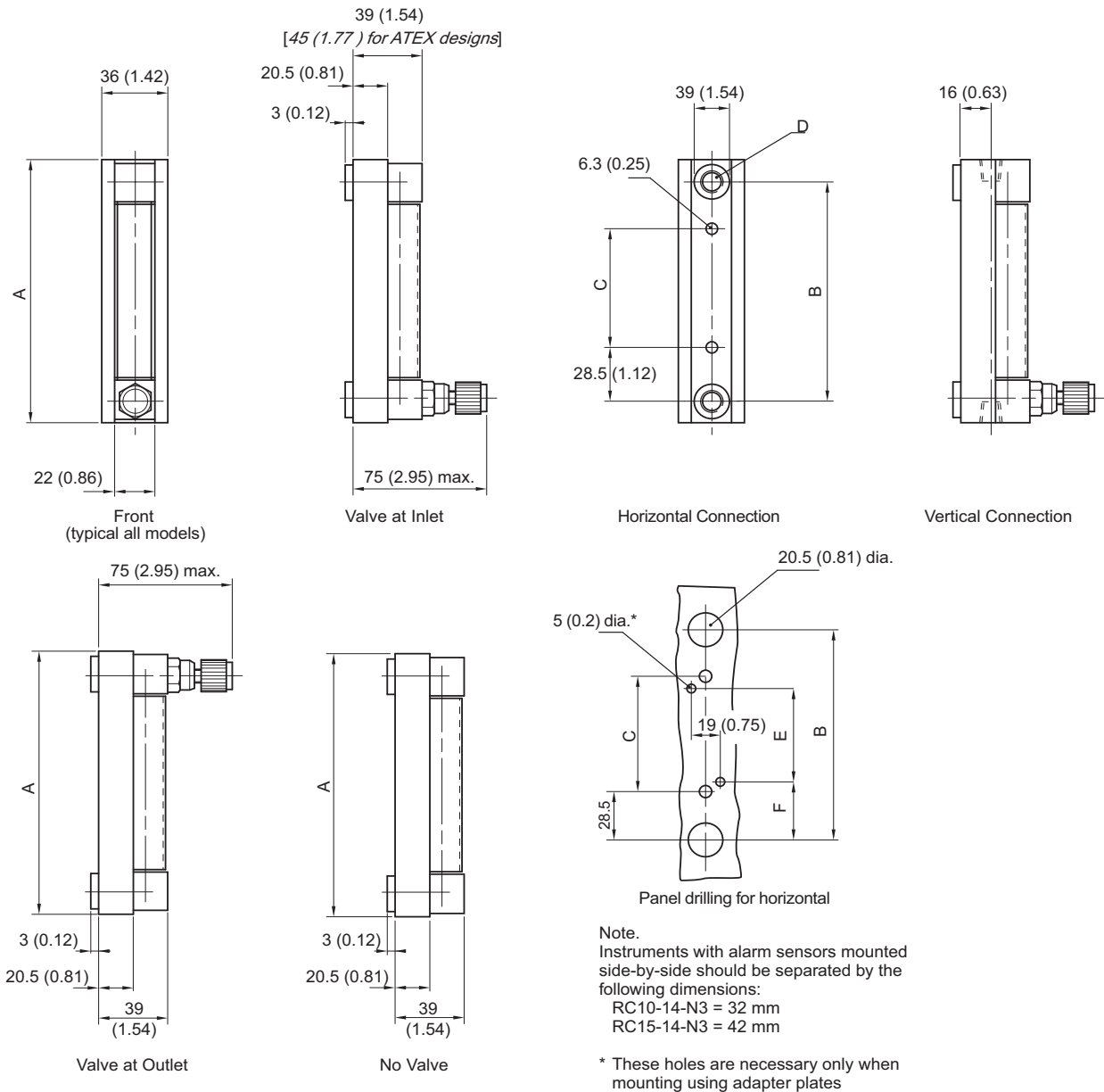
**Notes.**

- a) Applies only with built-in differential pressure regulator  
b) Only with % scale. Not available with differential pressure regulator.  
c) Not available with differential pressure regulator.  
d) For ordering information only.

Overall Dimensions

In-line and Front Panel-mounting (horizontal and vertical connections)

Dimensions in mm (in.)

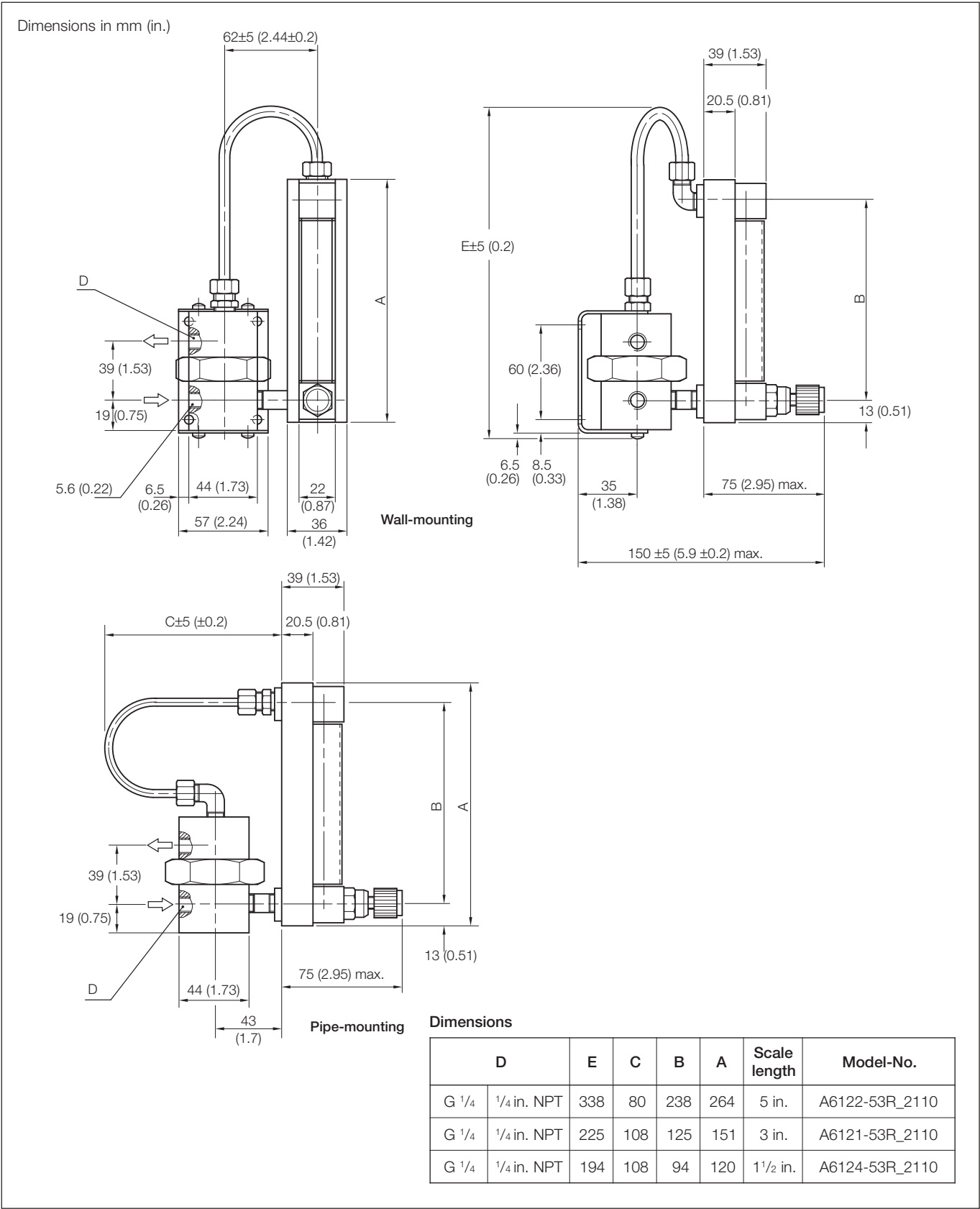


Dimensions

	D	F	E	C	B	A	Scale Length	Model No.
G 1/4	1/4 in. NPT	36.5	165	181	238	264	4/5 in.	A6x32/42
G 1/4	1/4 in. NPT	27.2	71	68	125	151	3 in.	A6x31/41
G 1/4	1/4 in. NPT	27.2	40	37	94	120	1 1/2 in.	A6x34/44
G 1/4	1/4 in. NPT	27.2	71	68	125	151	3 in.	A6x35/45



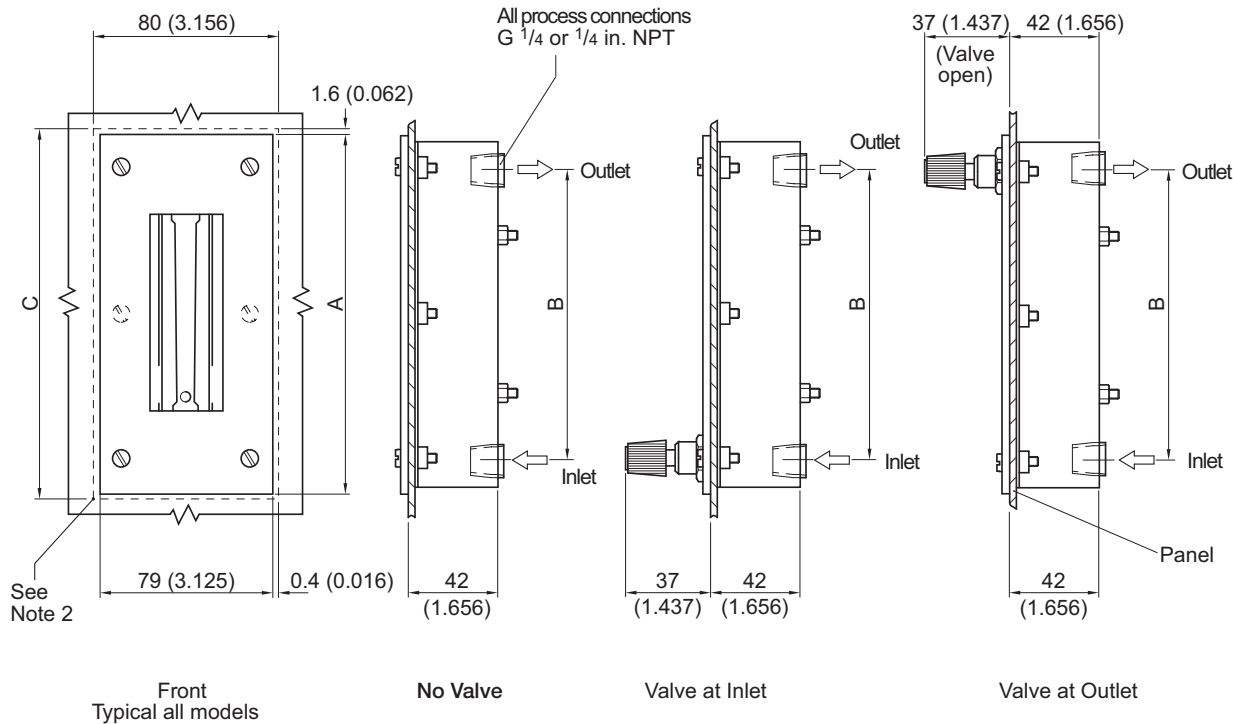
Purgemaster with Regulator



...Overall Dimensions

Panel-mounting (horizontal connections)

Dimensions in mm (in.)



Dimensions

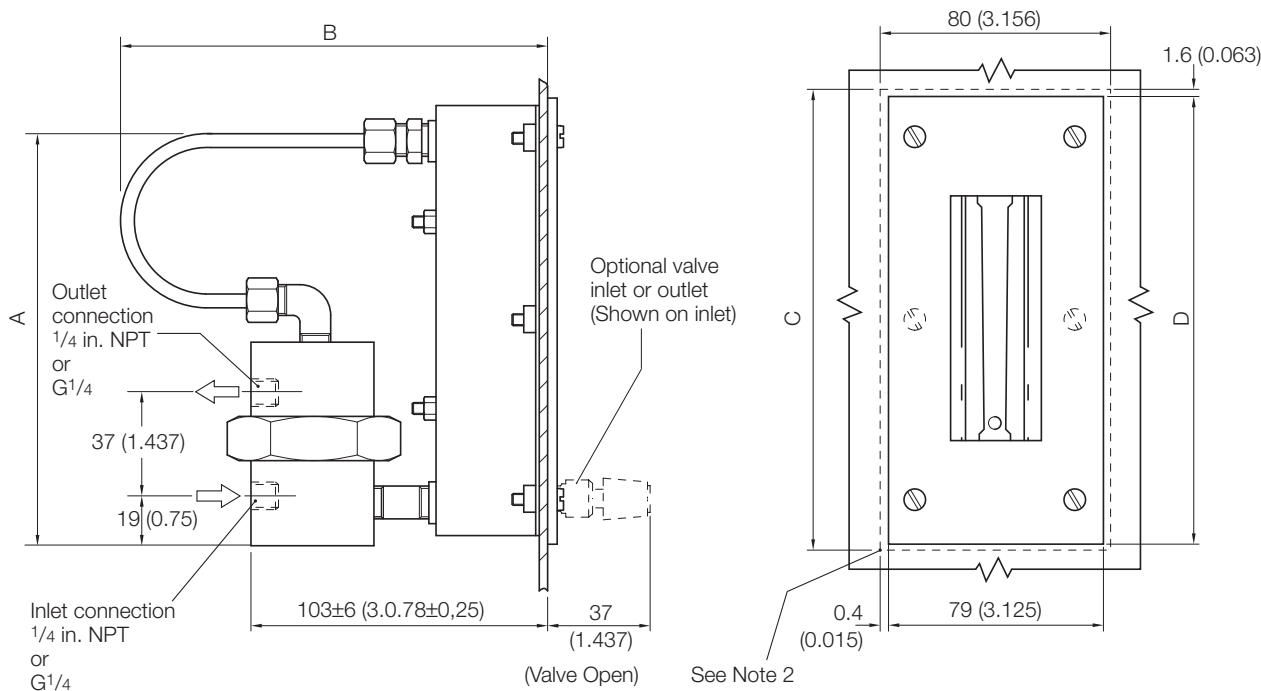
Nom. Scale Length		A		B		C	
in.	mm	in.	mm	in.	mm	in.	mm
1 1/2	38	4 31/32	126	3 23/32	94	5 3/32	129
3	76	6 3/16	157	4 15/16	125	6 5/16	160
5	127	10 5/8	270	9 3/8	238	10 3/4	273
10	254	15 1/16	383	13 13/16	351	15 3/16	386

Notes.

- 1) All dimensions are subject to a manufacturing tolerance of  $\pm 3$  mm (0.125), unless otherwise specified.
- 2) Dotted line indicates rear of panel clearance requirements.
- 3) Panel hardware for 8 (0.312) max. panel thickness.

Panel-mounting with Differential Pressure Regulator

Dimensions in mm (in.)



Dimensions

Scale Length		A		B		C		D	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
1 1/2	38	5 7/8	149	5 7/8 ± 1/4	149 ± 6	5 3/32	129	4 31/32	126
3	76	5 7/8	149	5 7/8 ± 1/4	149 ± 6	6 5/16	160	6 3/16	157
5	127	10 1/4	260	4 21/32 ± 1/4	118 ± 6	10 3/4	273	10 5/8	270
10	254	14 11/16	373	4 21/32 ± 1/4	118 ± 6	15 3/16	386	15 1/16	383

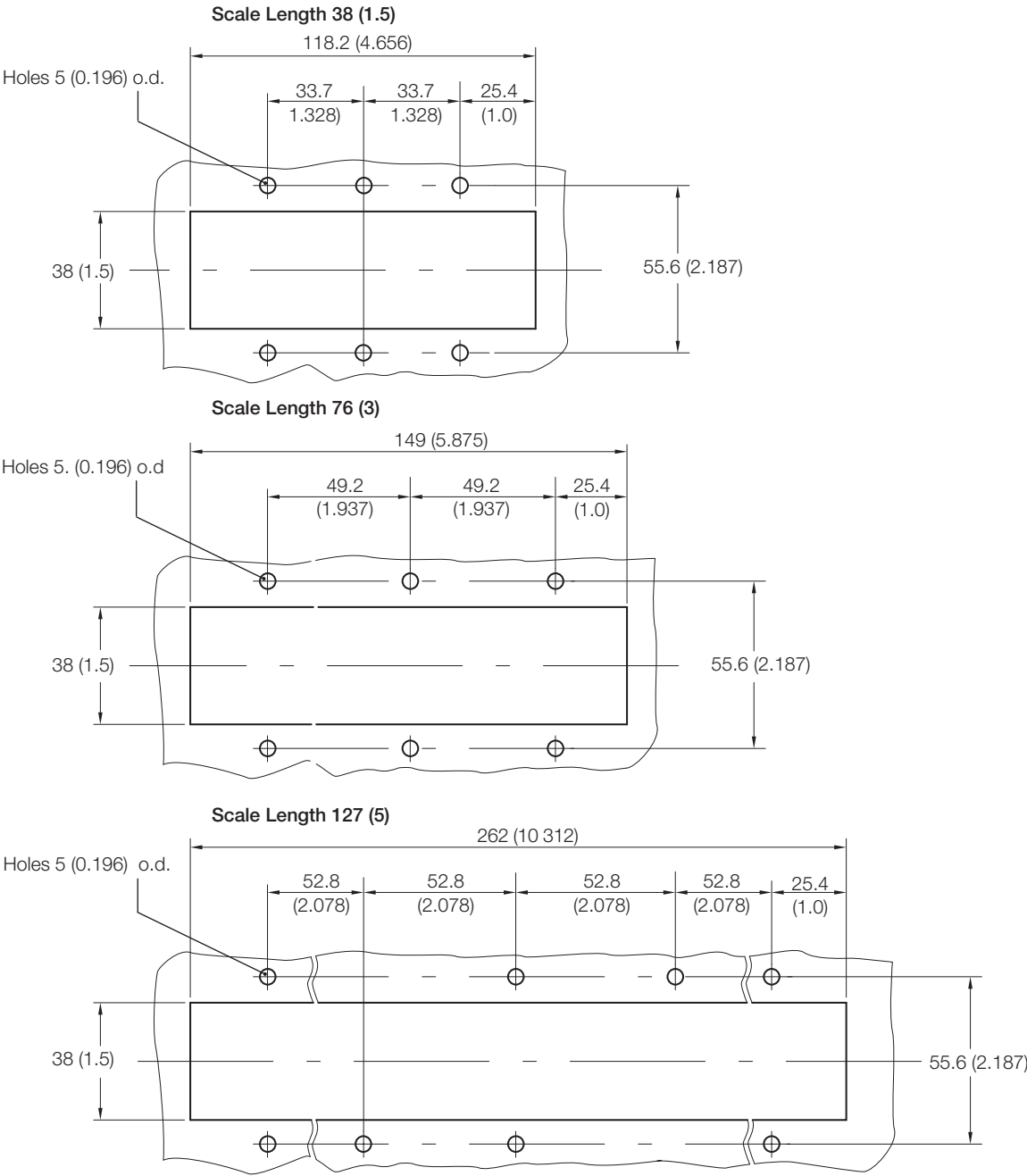
Notes.

- 1) All dimensions are subject to a manufacturing tolerance of ± 3 mm (0.125 in.), unless otherwise specified.
- 2) Dotted line indicates rear of panel clearance requirements.
- 3) Panel hardware for 8 (0.312) max. panel thickness

...Overall Dimensions

Panel Cut-out for Panel-mounting

Dimensions in mm (in.)



## Alarm Unit for Purgemaster

The alarm comprises a ring sensor and associated switching amplifier, available as an accessory, for glass-tube type variable-area flowmeters, type A6x31/41 and A6x32/42.

Clamped directly to the body, the ring sensor is continuously adjustable across the overall metering range. The ring sensor can be used with all metal-float equipped flowmeters according to the capacity tables.

## Principle of Operation

The ring sensor, with a bistable switching action, energizes the relay in the amplifier when the float reaches the trigger level. It remains in that position, even if the float continues to move towards the alarm zone, thus leaving the trigger level. The relay de-energizes as soon as the float crosses the trigger level from the opposite direction and moves back from the alarm zone into the normal operating range. The actual float position – above or below the trigger level – is indicated precisely.

Operation in a hazardous area is possible, since the ring sensor used is an intrinsically safe switch with an intrinsically safe circuit. Flowmeter Model A6x31/41 is suitable for use either as a minimum alarm or a maximum alarm, due to its short metering tube. Model A6x32/42 is recommended if both alarm operations are required.

## Design Features

- Sensor height 14 mm, minimizes coverage of the scale
  - Integrated clamp secures device directly to the meter body
- No automatic adjustment during operation is possible

## Specification – Ring Sensor

### Part Nos.

Measuring tube 1/8 in. type RC10-14-N3-Y115614

Measuring tube 1/4 in. type RC15-14-N3-Y115615

### Supply voltage

10 V DC

### Operating range

In direction 1 – 2.9 mA

In direction 2 – 4.8 mA

### Permissible resistance of control cable

$\leq 100 \Omega$

### Repeatability

1 % (T = constant)

### Temperature drift

$\pm 10 \%$

### Permissible ambient temperature

0 to 40 °C (32 to 104 °F)

### Permissible process temperature

0 to 40 °C (32 to 104 °F)

### Connection cable

LIFYY x 0.14 mm<sup>2</sup>

### Cable length

5 m (16.5 ft)

### Housing

Black Polycarbonate

### Protection type as per EN 60529

IP67

### Certificate of conformity

Ring Sensor only:	PTB 99 ATEX 2128X II 2G EEx ia IIC T6
Flowmeter with Ring Sensor:	BASEEFA 03 ATEX 0424X II 2G EEx c T6 – T4
Flowmeter without Ring Sensor:	BASEEFA 03 ATEX 0424X II 2GD EEx c 130°C

### Weight

40 g (1.4 oz.) approx.

...Alarm Unit for Purgemasters

Specification – Switching Amplifier

Switch amplifier

Amplifier	Supply Voltage	Channels	Certificate number
KFD2-SR2-Ex1.W	24 V DC	1	PTB 00 ATEX 2080
KFD2-SR2-Ex2.W	24 V DC	2	
KFA5-SR2-Ex1.W	115 V AC	1	Protection class
KFA5-SR2-Ex2.W	115 V AC	2	IP20
KFA6-SR2-Ex1.W	230 V AC	1	Electrical connection
KFA6-SR2-Ex2.W	230 V AC	2	Terminals

**Weight**  
0.15 kg (0.33 lb) approx.

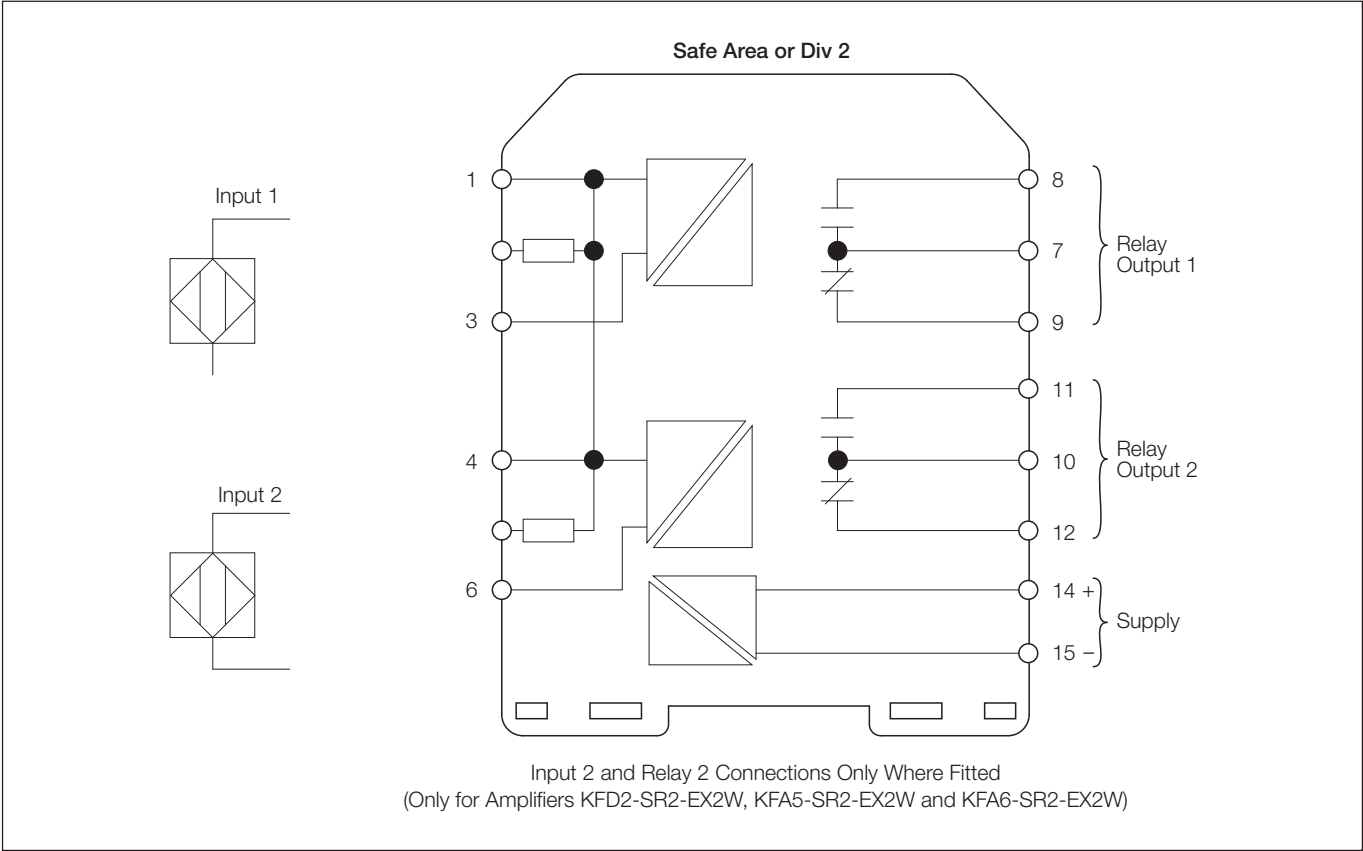
**Output**  
Relay with potential-free changeover contacts.  
Switching capacity max. 2 A at 250 V AC

**Power consumption**  
Max. 1 W

**Permissible ambient temperature**  
-20 to +60 °C (-4 to 140 °F)

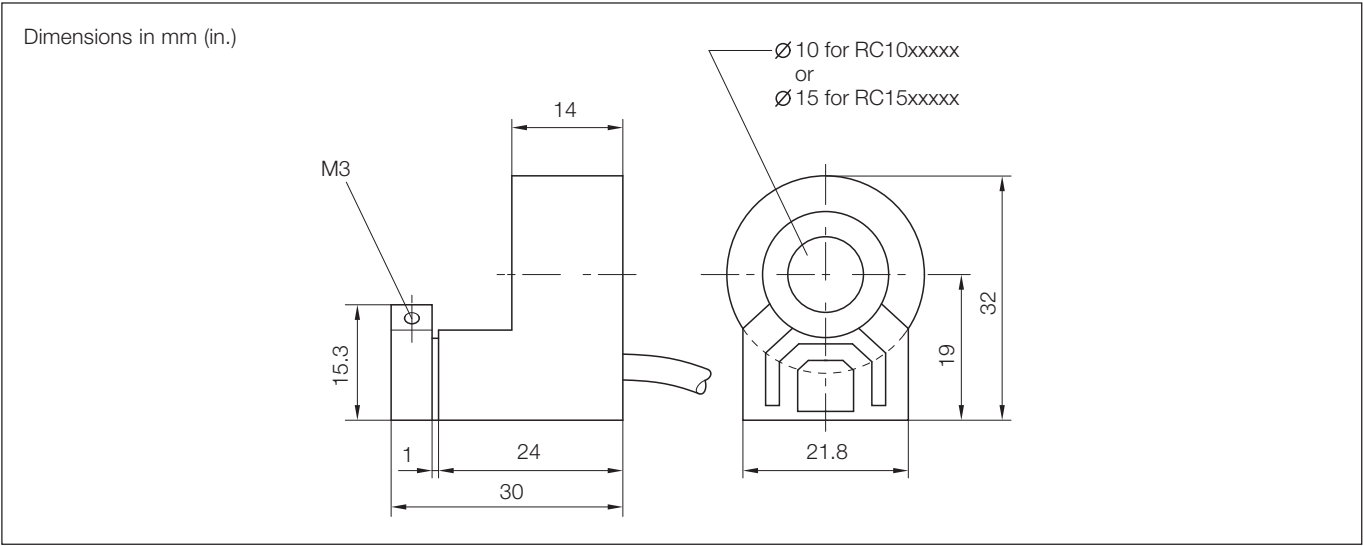
**Ex protection**  
Circuits in Zone 0/1/2 – EEx II (I) G D [EEx aj] IIC  
 $U_o = 10.5\text{ V}$   
 $I_o = 13\text{ mA}$   
 $P_o = 34\text{ mW}$

Electrical Connections

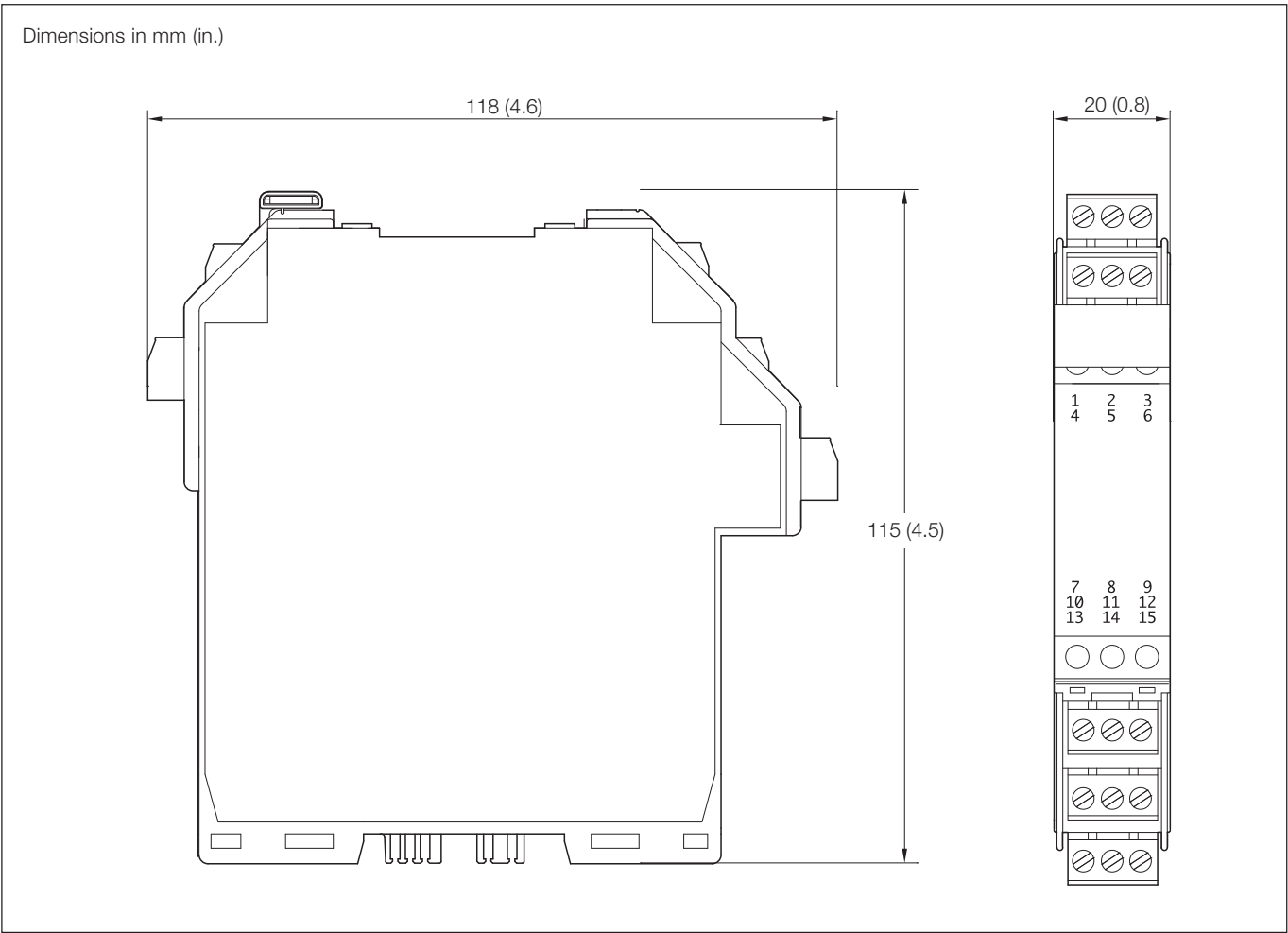


Electrical Connections

Overall Dimensions



Ring Sensor



Switch Amplifier

## Contactos/Contacts:

### Comercial/Commercial:

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