

RCD DIFFERENTIAL PRESSURE FLOWMETERS



Flow
Pressure
Level
Temperature
measurement
monitoring
control



- 0.15-1 to 85-600 GPM Liquids
- 2.5-25 to 300-1700 SCFM Gases
- 1/2" to 3" Line Sizes
- Bronze or 316-Ti Stainless Steel
- Mechanical Indicator, Digital Indicator, Transmitters and Switches Available
- Custom Calibrations for Density and Viscosity

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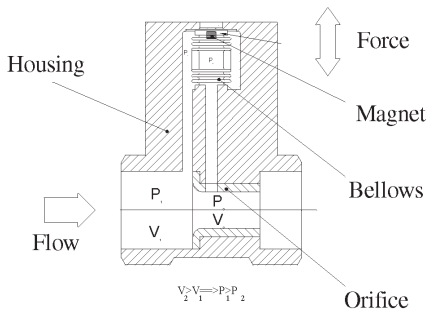
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www.kobold.com

Model:
RCD

Features

- 0.15-1 to 85-600 GPM Liquids
- 2.5-25 to 300-1700 SCFM Gases
- 1/2" to 3" Line Sizes
- Bronze or 316-Ti Stainless Steel
- Mechanical Indicator, Digital Indicator, Transmitters and Switches Available
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The RCD series differential pressure flowmeter measures flows of liquids and compressed gases using the orifice principle. The orifice, located in the flow body, generates a differential pressure which varies with flowrate. The differential pressure is applied to a measuring bellows. The measuring bellows is linked either to a mechanical indicator, or to a hall effect sensor, which is input to a compact or full featured electronic display and controller.



RCD series Differential Pressure Flowmeter

The unique KOBOLD design features a single measuring bellows making its accuracy unaffected by system pressure fluctuations. The meter movement is a single fulcrum lever design which is simple, yet very reliable, with a minimum of wear parts. The RCD is available with bronze or stainless steel bodies ranging in size from 1/2" NPT to 3" NPT. The various electronic display and control units offer a variety of options such as digital or bargraph displays, adjustable switches and flow transmitters.

Specifications

Flow Ranges

Liquids:	1 to 7 GPM through 100 to 600 GPM
Gases:	2.5-25 SCFM through 300 to 1700 SCFM

Accuracy:	±3% of full scale
Repeatability:	±1% of full scale

Maximum Temperature:	
Mechanical Display:	212°F
Electronic Display:	176°F

Maximum Pressure: 580 PSIG

Maximum Pressure Drop: 5 PSI

Indicator Housing: Epoxy coated aluminum, polycarbonate, NEMA 4X

Wetted Materials
Bronze Versions: Bronze, 316-Ti stainless steel, buna-n

SS Versions: 316-Ti stainless steel, viton



RCD-Z Mechanical Indicator

RCD-Z Specifications

Flow Units

Liquid: GPM
 Gases: SCFM
 Optional: LPM, M3/Hr, special scales on request

Enclosure: Epoxy coated aluminum & polycarbonate, NEMA 4X



RCD-C Compact Electronics

RCD-C Specifications

Input Power: 24 VDC \pm 20%, 80 mA
 Display: 3 digit LED
 Switch: PNP or NPN open collector, 300 mA
 Max. short circuit protected

Flow Transmitter: 4-20 mA 3 wire
 Housing: 304 SS, NEMA 4X
 Electrical Connection: Micro-DC male, 5-pin

RCD-D Digital Display/Controller



RCD-K Digital & Bargraph Display/Controller

RCD-K Specifications

Input Power: 115 VAC, 24 VDC, 24 VAC, 48 VAC or 230 VAC
 Display: 3-1/2 Digit LED and Bargraph, 270°
 Relays: 2 SPDT programmable setpoint,
 5 amps @ 230 VAC

Flow Transmitter: 4-20 mA, 4-wire
 Enclosure: Epoxy coated aluminum & polycarbonate, NEMA 4X

***For all versions calibrations for compressed gases, liquid viscosity and density available.**

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Ordering Codes For Liquid Flowmeters

Range GPM	Material		Fitting
	Bronze	Stainless Steel	
0.15-1 0.3-2 0.5-3 0.6-4 0.9-6 1-7 2-11	RCD-1100G RCD-1101G RCD-1102G RCD-1103G RCD-1104G RCD-1105G RCD-1110G	RCD-1200G RCD-1201G RCD-1202G RCD-1203G RCD-1204G RCD-1205G RCD-1210G	N4=1/2" NPT
0.6-4 0.9-6 1.5-10 2-13 3-17 3-20 3.5-25	RCD-1111G RCD-1112G RCD-1113G RCD-1114G RCD-1115G RCD-1119G RCD-1120G	RCD-1211G RCD-1212G RCD-1213G RCD-1214G RCD-1215G RCD-1219G RCD-1220G	N5=3/4" NPT
2-11 2-13 3-20 4-25 6-33 6-42	RCD-1121G RCD-1122G RCD-1123G RCD-1124G RCD-1125G RCD-1130G	RCD-1221G RCD-1222G RCD-1223G RCD-1224G RCD-1225G RCD-1230G	N6=1" NPT
4-25 6-33 8-55 10-70 12-85 20-110	RCD-1131G RCD-1132G RCD-1134G RCD-1135G RCD-1137G RCD-1140G	RCD-1231G RCD-1232G RCD-1234G RCD-1235G RCD-1237G RCD-1240G	N8=1-1/2" NPT
30-185 30-230	RCD-1145G RCD-1150G	RCD-1245G RCD-1250G	N9=2" NPT
30-250 60-395 85-600	RCD-1155G RCD-1160G RCD-1165G	RCD-1255G RCD-1260G RCD-1265G	NB=3" NPT

Housing Styles Mechanical Indicator			
Indication	Flow Direction	Indicator Position	
Z=270° Mechanical	L = left to right R = right to left B = up	L = left of pipe R = right of pipe T = above pipe B = below pipe	
Full Size Display/Controller			
Indication	Power Supply	Output5	Switches
K = Bargraph & Digital	4 = 115 VAC 3 = 24 VDC 2 = 24 VAC 1 = 48 VAC 0 = 230 VAC	0 = none 1 = 0-10 VDC 2 = 0-20 mA 4 = 4-20 mA *none available for bargraph	0 = none 2 = 2 SPDT relays
Compact Electronics			
Indication	Power Supply	Output	
C = Compact Electronics	3 = 24 VDC	0R = 2 PNP switches 0M = 2 NPN switches 4P = 4-20 mA + 1 PNP switch 4N = 4-20 mA + 1 NPN switch	
Optional Calibration			
Model Number Suffix	Description		
-C	Calibration for specific gravity other than water (required if specific gravity is <0.95 or >1.05)		
-V	Calibration for viscous liquids (required if viscosity is > 10 cSt)		

Accessory: mating Micro-DC plug with 10 foot cable for compact electronics (RCD-C) part number 807.007

Example: RCD model number = RCD-1140GN8K400C



Ordering Codes For Gas Flowmeters

Range SCFM	Material		Fitting	Housing Styles Mechanical Indicator																						
	Bronze	Stainless Steel		Indication	Flow Direction	Indicator Position																				
2.5-25 5-40	RCD-1105S RCD-1110S	RCD-1205S RCD-1210S	N4=1/2" NPT	Z=270° Mechanical	L = left to right R = right to left B = up	L= left of pipe R = right of pipe T = above pipe B = below pipe																				
10-60 15-75	RCD-1115S RCD-1120S	RCD-1215S RCD-1220S	N5=3/4" NPT	Full Size Display/Controller <table border="1"> <thead> <tr> <th>Indication</th> <th>Power Supply</th> <th>Output</th> <th>Switches</th> </tr> </thead> <tbody> <tr> <td rowspan="5">K = Bargraph & Digital</td> <td>4 = 115 VAC</td> <td>0 = none</td> <td>0 = none</td> </tr> <tr> <td>3 = 24 VDC</td> <td>1 = 0-10 VDC</td> <td>2 = 2 SPDT relays</td> </tr> <tr> <td>2 = 24 VAC</td> <td>2 = 0-20 mA</td> <td></td> </tr> <tr> <td>1 = 48 VAC</td> <td>4 = 4-20 mA</td> <td></td> </tr> <tr> <td>0 = 230 VAC</td> <td>*none available for bargraph</td> <td></td> </tr> </tbody> </table>			Indication	Power Supply	Output	Switches	K = Bargraph & Digital	4 = 115 VAC	0 = none	0 = none	3 = 24 VDC	1 = 0-10 VDC	2 = 2 SPDT relays	2 = 24 VAC	2 = 0-20 mA		1 = 48 VAC	4 = 4-20 mA		0 = 230 VAC	*none available for bargraph	
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25-115 20-140	RCD-1125S RCD-1130S	RCD-1225S RCD-1230S	N6=1" NPT																							
30-240 50-400	RCD-1135S RCD-1140S	RCD-1235S RCD-1240S	N8=1-1/2" NPT	Compact Electronics <table border="1"> <thead> <tr> <th>Indication</th> <th>Power Supply</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>C = Compact Electronics</td> <td>3 = 24 VDC</td> <td>0R = 2 PNP switches 0M = 2 NPN switches 4P = 4-20 mA + 1 PNP switch 4N = 4-20 mA + 1 NPN switch</td> </tr> </tbody> </table>			Indication	Power Supply	Output	C = Compact Electronics	3 = 24 VDC	0R = 2 PNP switches 0M = 2 NPN switches 4P = 4-20 mA + 1 PNP switch 4N = 4-20 mA + 1 NPN switch														
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150-850 200-1200	RCD-1155S RCD-1160S	RCD-1255S RCD-1260S	NB=3" NPT	Compact Electronics <table border="1"> <thead> <tr> <th>Indication</th> <th>Power Supply</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>C = Compact Electronics</td> <td>3 = 24 VDC</td> <td>0R = 2 PNP switches 0M = 2 NPN switches 4P = 4-20 mA + 1 PNP switch 4N = 4-20 mA + 1 NPN switch</td> </tr> </tbody> </table>			Indication	Power Supply	Output	C = Compact Electronics	3 = 24 VDC	0R = 2 PNP switches 0M = 2 NPN switches 4P = 4-20 mA + 1 PNP switch 4N = 4-20 mA + 1 NPN switch														
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300-1700	RCD-1165S	RCD-1265S	NB=3" NPT																							

Accessory: mating micro-DC plug with 10 foot cable for compact electronics (RCD-C) - part number 807.007

Example: RCD model number = RCD-1135SN8C34P



HOW TO ORDER

To Properly Specify the RCD Series:

1. Choose the ordering code for the desired range, materials and available fitting size (RCD-1105SN4).

2. Choose the ordering code for the desired indicator type (e.g. mechanical, compact, etc.)

3. Choose the codes for the flowmeter installed flow direction (required for mechanical indicator only):

- LT = Flow from left to right
- RT = Flow from right to left
- BL = Vertical up flow, dial on left
- BR = Vertical up flow, dial on right

4. Specify the process media:

Liquids - Specify the type of liquid. If other than water, specify the viscosity and the specific gravity or density. Use option codes C or V as necessary. The RCD will be calibrated for these conditions.

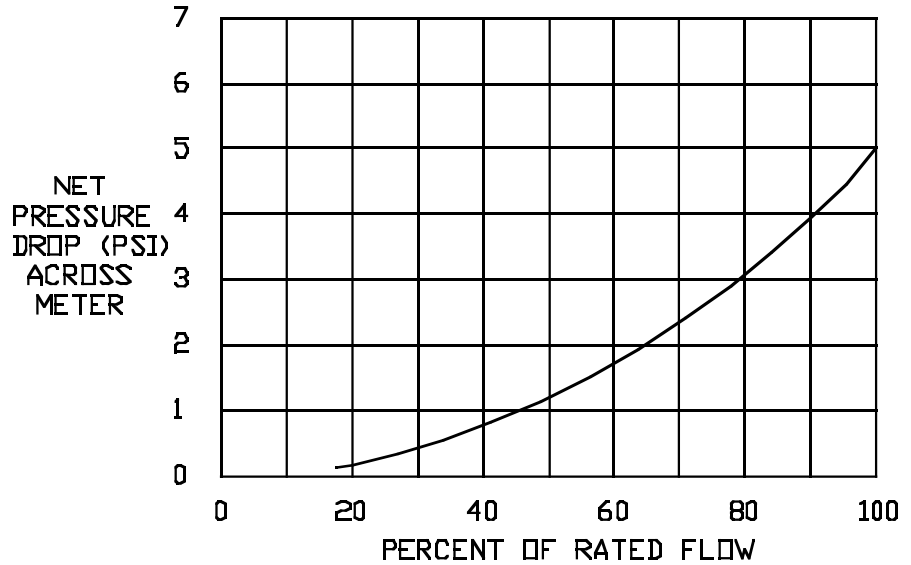
Gases -specify the type of gas. Specify the normal operating pressure and temperature. The RCD will be calibrated for these conditions.

NOTE: Calibrations for compressed gases or liquids other than water may change the measuring range from those listed in the part number tables. Contact KOBOLD to determine the corrected flow range which will be provided based on operating conditions.

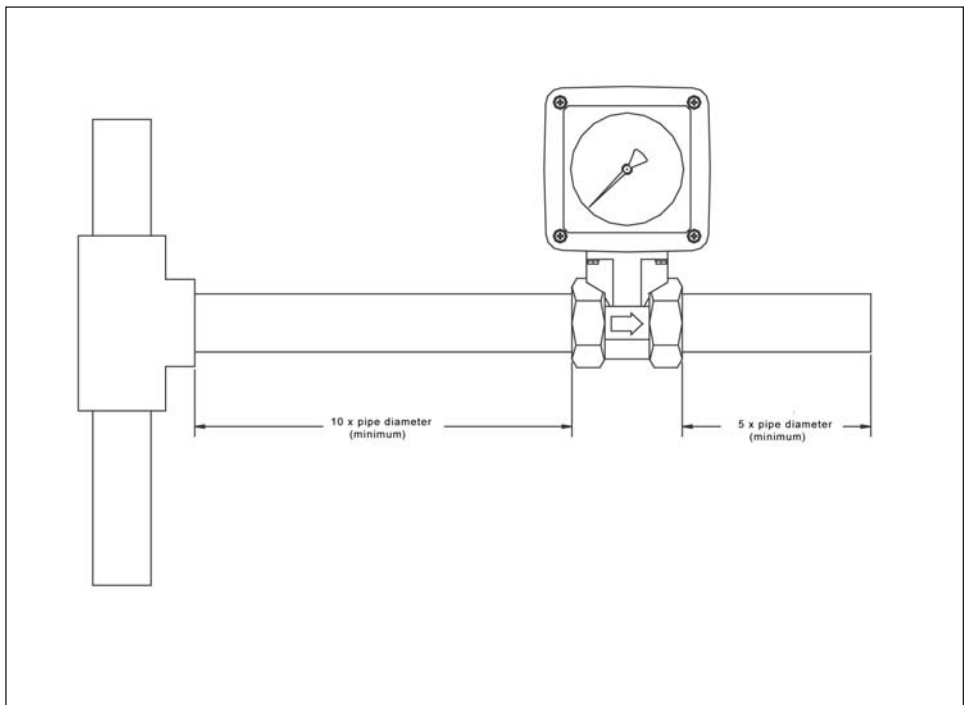
RCD Installation Piping Requirements

In order to guarantee accurate readings, the RCD series must be installed with a minimum of 10 diameters of straight piping at the inlet and 5 diameters of straight piping at the outlet. This straight piping must be the same diameter as the flowmeter fittings and should have no bends, elbows, tees, valves or other plumbing appurtenances.

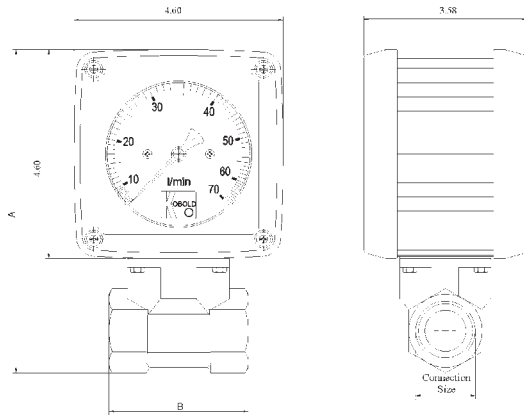
RCD Flowmeter Head Loss vs. Flow Rate



RCD Installation Piping Requirements



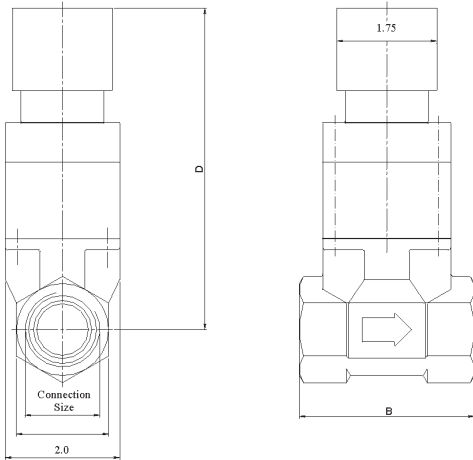
RCD-Z Mechanical Indicator



Dimensions (inches)
*unless otherwise specified

Connection Size	A	B	C (mm)	D
1/2"	7.52	3.07	SW27	5.63
3/4"	7.52	3.07	SW41	5.63
1"	7.52	3.07	SW41	5.63
1-1/2"	8.11	3.07	SW55	6.22
2"	8.03	3.14	SW70	6.14
3"	8.70	4.17	SW100	6.81

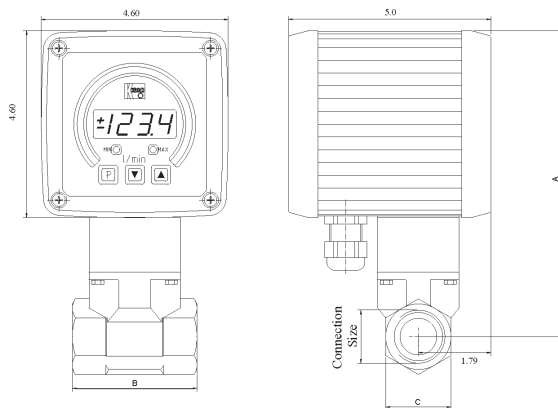
RCD-C Compact Electronics



Dimensions (inches)
*unless otherwise specified

Connection Size	A	B	C (mm)	D
1/2"	7.52	3.07	SW27	5.63
3/4"	7.52	3.07	SW41	5.63
1"	7.52	3.07	SW41	5.63
1-1/2"	8.11	3.07	SW55	6.22
2"	8.03	3.14	SW70	6.14
3"	8.70	4.17	SW100	6.81

RCD-K



Dimensions (inches)
*unless otherwise specified

Connection Size	A	B	C (mm)	D
1/2"	7.52	3.07	SW27	5.63
3/4"	7.52	3.07	SW41	5.63
1"	7.52	3.07	SW41	5.63
1-1/2"	8.11	3.07	SW55	6.22
2"	8.03	3.14	SW70	6.14
3"	8.70	4.17	SW100	6.81

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<p>RCD Series Flowmeters Application Guide Form # RCD-001 Rev. 11/01/01</p> <p style="text-align: right;">FAX to: KOBOLD Instruments Inc. 412-788-4890 (USA) 514-428-8899 (Canada)</p>	<p>Customer Name: _____</p> <p>Company Name: _____</p> <p>Phone: _____</p> <p>Fax: _____</p>
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Quote #: _____ Date: _____ Price: _____ Each

Part Number: _____

* To ensure fast order processing, please retain the completed quote form and send it along with your purchase order.

Calibrated Measuring Range: _____

Design Conditions

Accurate design pressure and temperature are essential to ensure the flowmeter will be built to operate without damage. Please fill out accurately and completely.

List Design Conditions

- 1. **Pressure:** Maximum _____ PSIG
- 2. **Temperature:** Maximum _____ °F

Calibration Conditions: Accurate calibration conditions are required to ensure that the flowmeter will be factory calibrated to give accurate readings at the user's **normal operating conditions**. Please fill out accurately and completely.

Calibration Conditions for Liquid Flow Applications

- 1. **Type of Liquid:** _____
- 2. **Normal Operating Temperature:** _____ °F
- 3. **Viscosity at Normal Operating Temp:** _____
- 4. **Specific Gravity at Normal Operating Temp:** _____
- 5. **Desired Measuring Range and Units:** _____

Note: Items 3 & 4 not required for water flow

Calibration Conditions for Gas Flow Applications

- 1. **Type of Gas:** _____
- 2. **Normal Operating Temperature:** _____ °F
- 3. **Normal Pressure at Outlet Fitting:** _____ PSIG
- 4. **Specific Gravity (required for gas mixes only):** _____
- 5. **Desired Measuring Range and Units:** _____

Note: The calibration pressure required is the pressure that the meter sees at its outlet fitting.

Flowmeter Options

- 1. **Body Material:** Bronze w/ Buna-N Seal 316 SS w/ Viton seal
- 2. **Desired Fitting Size:** 1/2" NPT 3/4" NPT 1" NPT 1-1/2" NPT 2" NPT 3" NPT
- 3. **Flow Direction:** Left to Right Right to Left Flow Up Dial on Right
 Flow Up Dial on Left

Indicator Options:

- 1. **Mechanical Indicator (RCD-Z)**
- 2. **Compact Electronics (RCD-C)**
 2 PNP switches 2 NPN switches
 4-20 mA + 1 PNP 4-20 mA + 1 NPN
- 3. **Bargraph Display/Controller (RCD-B)**
Input Power (specify): _____
Relays: None 2 SPDT relays

- 4. **Digital Display/Controller (RCD-D)**
Input Power (specify): _____
Output: None 4-20 mA
Relays: None 2 SPDT relays
- 5. **Digital & Bargraph Display/Controller (RCD-K)**
Input Power (specify): _____
Output: None 4-20 mA
Relays: None 2 SPDT relays