

FLOCAT

Flow meters, application assistance and technical support

**C-ES45-B Series
Instruction Manual**

P.N. C-ES99-B004

FLOCAT

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General Information
C-ER45-B002 - B009

These versatile impeller flow meters in 3/8" to 1" nominal pipe size employ jewel bearings for very low minimum flows. The 6-24 VDC pulse output of these meters is compatible with many different types of control, including a full range of FloCat rate displays and controls. The ES70-A series are blind 4-20mA transmitters recommended for use with the ES45 series flow meters.

ES45-B Series meters are available in 1/2" to 1" nominal sizes. The body material for the ES45-B002-B005 is polypropylene, with transparent acrylic covers for visual flow indication. Polypropylene covers are available as an option.

The ES45-B006-B009 is available standard with TFE housing, TFE cover, PVDF rotor, ceramic shaft, choice of o-ring material (EPDM or Viton), and optional silicon carbide shaft.

Specifications

Connections:

3/8", 1/2", 3/4", 1
 Female NPT standard,
 SAE thread optional

Materials:

Body: (B002-005): Polypropylene, (B006-009). TFE
 Cover: (B002-005): Acrylic, Polypro optional (B006-009):TFE
 Rotor: PVDF
 Shaft: (B002-005): Nickel tungsten carbide, zirconia ceramic optional (B006-009).zirconia ceramic, silicon carbide optional
 Bearings: Ruby

Max. Temperature:

160 °F (71 °C)

Max. Pressure:

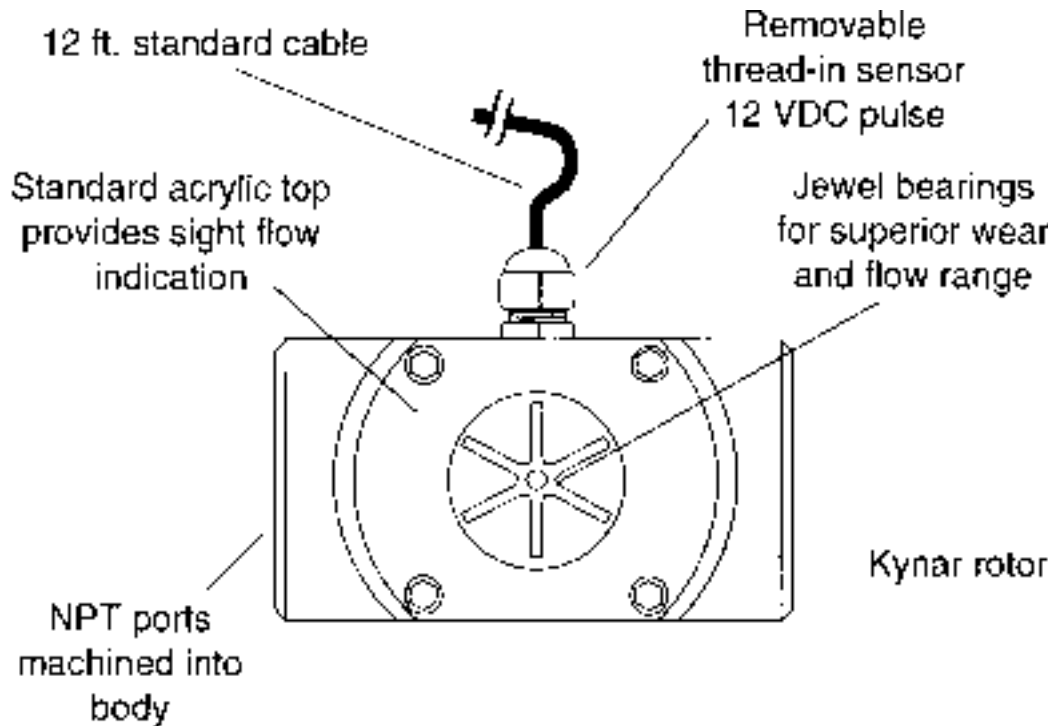
150 PSI (10 bar)

Accuracy:

±1% FS

Flow Rates:

Size	GPM	LPM
3/8	0.07-5	0.27-18.9
1/2	0.1 -10	0.38-37.9
3/4	0.2-20	0.75-75
1	0.5-40	1.90-150



Installation

Piping Requirements.

Standard fittings are female NPT. If the piping connected to the meter is metallic, care should be taken not to over-tighten. Straight pipe of at least five diameters upstream of the meter is recommended. Vertical, horizontal, or inverted (lens down) installations are all acceptable.

Warning:

This meter has low-friction bearings. Do not at any time test operation of the meter with compressed air. Doing so will subject it to rotational speeds many times those for which it was designed, and will certainly damage the rotor, shaft, and/or bearings.

Repair

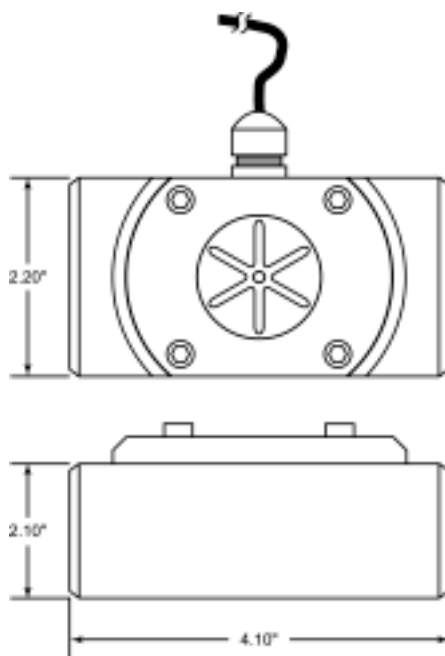
Rotor Replacement.

There is only one moving part to this meter. The bearings are made of sapphire, which rarely wears out, and will not need replacement unless they have been physically damaged by severe shock. The shaft is integrally molded into the rotor, and shaft and rotor are replaced as one part. To replace the rotor, remove all pressure from the meter. Then remove the four screws which hold the lens (or cover) in place. Lift the lens, then remove the rotor. When putting in the new rotor, be sure that the end of the shaft is started into the bearing before the lens is put into place. When putting on the lens, be sure that the shaft is also started into the upper bearing before lowering the lens into place. If any resistance is met when the lens is replaced, the shaft is not started into one of the bearings. Check that the lens o-ring is also in place, then replace the four screws and tighten.

Sensor Replacement.

The sensor ordinarily does not need replacement unless it is electrically damaged. If replacement is necessary, unthread the sensor by hand. Thread the replacement sensor in and tighten by hand.

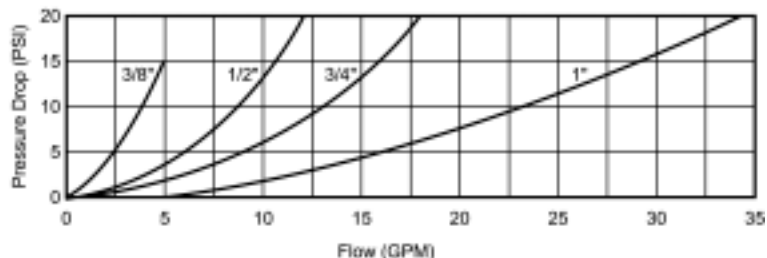
Dimensions



Nominal K-Factors

Size	Gallons	Liters
3/8"	1600	424
1/2"	500	132
3/4"	300	79
1"	90	24

Pressure Drop



General Information
C-ER45-B001 & B001-3/4

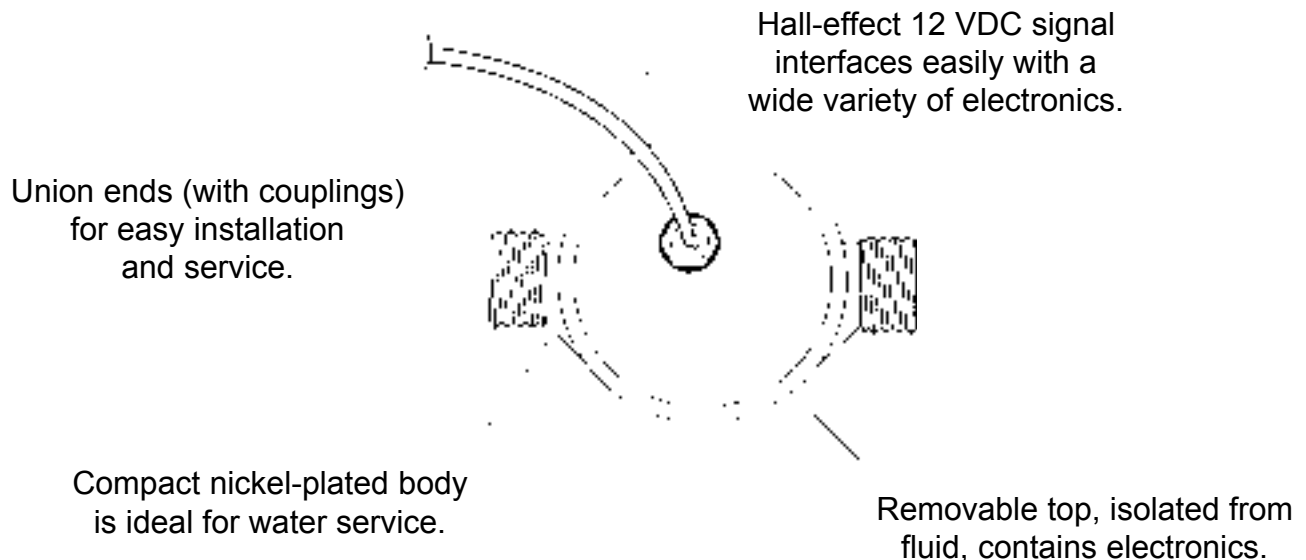
The C-ES45-B001 & B001-3/4 is a plated brass meter suited for clean water. It is available in 1/2" and 3/4" thread, with union type meter couplings. This meter is ideal for water applications in the ranges 0.2 to 20 GPM.

A 6-18 VDC square wave output makes the ES45-B series is ideal for many OEM control applications. This signal interfaces easily with programmable logic controllers and computer input boards.

C-ES45-B series meters can be combined with the C-ES75-A series readouts for reading flow rate and total flow, with 4-20 mA output. For metering pump pacing only, a standard divider is recommended.

Specifications

Connections:	1/2", 3/4" Male NPT
Materials:	
Body:	Nickel-plated brass
Rotor Chamber:	Thermoplastic
Rotor:	Thermoplastic
Shaft:	Nickel tungsten carbide
Bearings:	Sapphire, graphite
Max. Temperature:	185 ∞F (85 ∞C)
Max. Pressure:	175 PSI (12 bar)
Accuracy:	±1% FS
Flow Rates:	0.2 to 10 GPM 0.75 to 38 LPM
Standard K Factor:	
1/2"	308 Pulses per Gallon 81 Pulses per Liter
3/4"	174 Pulses per Gallon 46 Pulses per Liter
Sensor:	Hall-Effect
Signal:	6-18 VDC current sinking square wave
Max Current:	20 mA
Max Cable Run:	2,000 ft. (610 m)



Installation

Single-jet meters are somewhat insensitive to upstream and downstream flow conditions. For best results, however, upstream and downstream straight pipe of five diameters is recommended. Use the union couplings included with the unit for ease of installation and service.

Maintenance & Repair

Under most applications, the C-ES45-B001 & B001-3/4 should function for many years without requiring service. Certain electrical conditions could cause the Hall-effect sensor to fail. If this should occur, replace the sensor by unthreading it from the cap. Screw in a replacement sensor and reconnect.

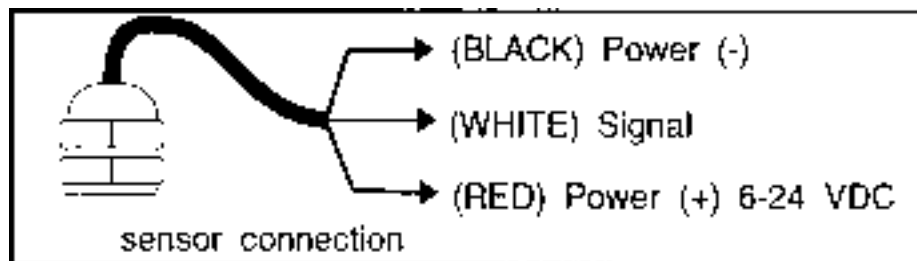
There is only one moving part, the propeller. This is ordinarily replaced at the factory, since the meter must be recalibrated at the time of replacement.

If it is necessary to field-replace a rotor, first snap off the black sensor cover. Then remove the snap ring retaining the brass top plate. Remove the plate to expose the rotor. Reverse the process after replacing the rotor.

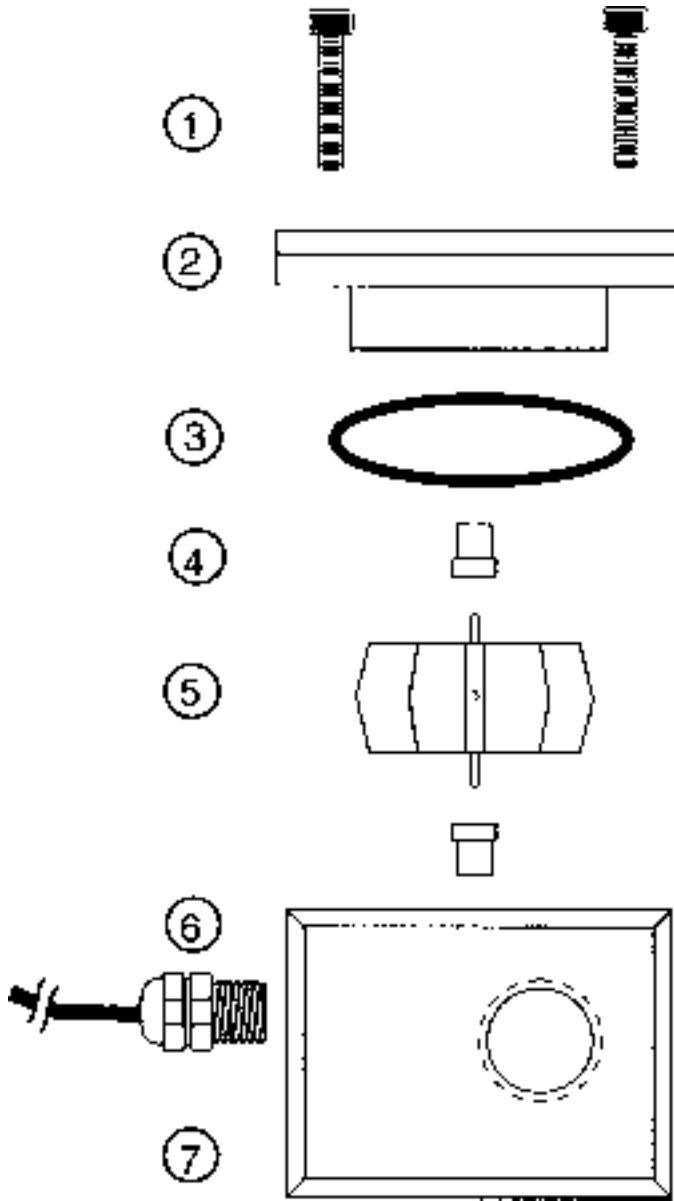
Electrical Connections.

There are three conductors to the sensor, two for positive and negative power and one for the signal. See the diagram below for color coding.

*Note: The Hall-Effect sensor used in the ES45-B Series flow meter is of the NPN type. The use of a pull-up resistor (12 K Ω nominal at 12 VDC) may be required if the input device is configured for PNP.

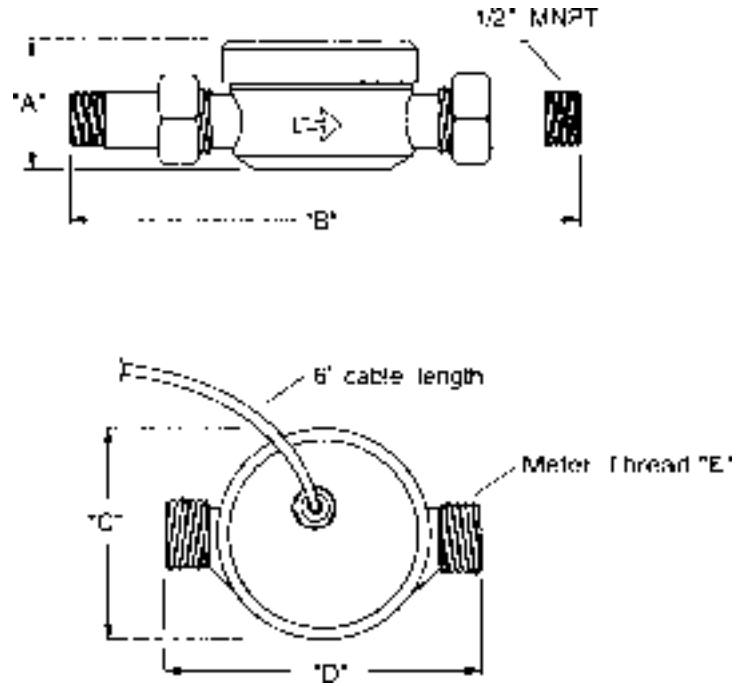


ES45-B002 - B009 Parts



Item	Discription	Quantity
1	Screw	4
2	Lens	1
3	O-Ring	1
4	Bearing Assembly	2
5	Rotor with Shaft	1
6	Sensor	1
7	Body	1

ES45-B001 Dimensions



Dimension	1/2"	3/4"
A	1.56	1.56
B	10.0	10.2
C	2.7	2.7
D	5.1	5.1
E	3/4" BSP	1" BSP