

**Recommended Practice**

---

---

---

---

**Nomenclature and  
Terminology for  
Extension-Type Variable  
Area Meters (Rotameters)**



ISA-RP16.4 — Nomenclature and Terminology for Extension Type Variable Area Meters (Rotameters)

ISBN 0-87664-343-8

Copyright ©1960 by the Instrument Society of America. All rights reserved. Printed in the United States of America. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), without the prior written permission of the publisher.

ISA  
67 Alexander Drive  
P.O. Box 12277  
Research Triangle Park, North Carolina 27709

---

## Preface

---

This Recommended Practice has been prepared as a part of the service of ISA toward a goal of uniformity in the field of instrumentation. To be of real value this report should not be static, but should be subject to periodic review. Toward this end the Society welcomes all comments and criticisms, and asks that they be addressed to the Standards and Practices Board Secretary, ISA, 67 Alexander Drive, P.O. Box 12277, Research Triangle Park, North Carolina 27709, e-mail: standards@isa.org.

This report was prepared by the Committee on Variable Area Meters 8D-RP16.

NAME	COMPANY
L. N. Combs, Chairman	E.I. du Pont de Nemours & Company
S. Blechman	Brooks Instrument Company, Inc.
W. A. Crawford, Past Chairman	E.I. du Pont de Nemours & Company
W. F. Dydak	Schutte & Koerting Company
R. W. Eberly	Schutte & Koerting Company
H. V. Mangin	Fischer & Porter Company
T. E. Quigley	E.I. du Pont de Nemours & Company
R. L. Shapcott	Weston Instruments Div., Daystrom Inc.

Approved for Tentative Publication by the Standards & Practices Board — July 1960.

NAME	COMPANY
G. G. Gallagher, Standards & Practices Department Vice President	The Fluor Corporation
F. E. Bryan, Aero-Space Standards Division Director	Douglas Aircraft Company
R. E. Clarridge, Intersociety Standards Division Director	General Electric Company
F. H. Winterkamp, Production Processes Standards Division Director	E.I. du Pont de Nemours & Company
E. J. Minnar, Standards & Practices Board Secretary	ISA Headquarters Staff

The assistance of those who aided in the preparation of this Recommended Practice by answering questionnaires, offering suggestions, and in other ways is gratefully acknowledged.



---

## Contents

---

<b>1 Purpose</b> .....	<b>7</b>
<b>2 History and development</b> .....	<b>7</b>
<b>3 Scope</b> .....	<b>7</b>
<b>4 Definitions and terminology</b> .....	<b>7</b>
4.1 Indicating extensions .....	7
4.2 Transmitting extensions .....	8
4.3 Alarms — extensions .....	8
4.4 Other extensions .....	8



---

## **1 Purpose**

---

The Recommended Practice is intended to provide a basis for nomenclature and terminology for extension type variable area meters (rotameters).

---

## **2 History and development**

---

The resultant of a survey sent out in 1954 to cover 250 meter users and manufacturers indicated among other factors, the need for standardized terminology. Using these replies as a basis, a committee was formed and this Recommended Practice was developed.

---

## **3 Scope**

---

This Recommended Practice has been prepared to define the nomenclature and terminology of various types of extensions applicable to 5 inch (125 mm) glass and metal tube variable area meters (rotameters) covered in ISA-RP 16.1.2.3.

---

## **4 Definitions and terminology**

---

An extension is a device for translating float motion into a useful secondary function for either indicating, alarming, transmitting or other secondary functions. An extension usually consists of an extension tube, an extension housing, and the necessary adaptor to the primary rotameter, but may be any auxiliary device fixed to the rotameter which performs the functions outlined below.

### **4.1 Indicating extensions**

#### **4.1.1 Magnetic**

A device that provides flow rate indication by means of a magnetic coupling between the extension of the metering float and an external indicator follower surrounding the extension tube.

#### **4.1.2 Direct**

A device that provides flow rate indication by means of viewing the position of the extension of the metering float within a glass extension tube.

## **4.2 Transmitting extensions**

### **4.2.1 Pneumatic**

A system that converts float position to a proportional standard pneumatic signal. A magnetic coupling connects the internal float extension with an external mechanical system linked to a pneumatic transmitter.

### **4.2.2 Electric or electronic**

A system that converts float position to a proportional electric signal (either AC or DC), or to a proportional shift or unbalance in impedance which is balanced by a corresponding shift in impedance in the receiving instrument.

## **4.3 Alarms — extensions**

### **4.3.1 Magnetically actuated**

A device attached to the meter body which contains an electrical switch and which is magnetically actuated by the metering float extension to signal a high or low flow. The switch is adjustable with respect to the float position over a range equal to the travel of the metering float. Standard switch ratings are usually 0.3 amperes for 110 volt, 60 cycle AC supply (five amperes or more if relays are used).

### **4.3.2 Electrically operated**

Usually a highly sensitive induction type device for signalling high or low flows or deviations from any set flow. The device consists of a sensing coil positioned around the extension tube of the rotameter. Movement of the metering float into the field of the coil causes a low level signal change which is usually amplified to a level suitable for performing annunciator or control functions.

## **4.4 Other extensions**

### **4.4.1 Recording**

The recorder is attached directly to the meter body with the recorder pen positioned by the metering float through a magnetic coupling.

### **4.4.2 Integrating**

In the same manner as described under 4.4.1, an integrator which derives its input from the motion of the float can be installed within the extension housing.

### **4.4.3 Controlling**

In the same manner as described under 4.4.1, a controller which derives its input from the motion of the float can be installed within the extension housing.





---

---

---

---

Developing and promulgating technically sound consensus standards, recommended practices, and technical reports is one of ISA's primary goals. To achieve this goal the Standards and Practices Department relies on the technical expertise and efforts of volunteer committee members, chairmen, and reviewers.

ISA is an American National Standards Institute (ANSI) accredited organization. ISA administers United States Technical Advisory Groups (USTAGs) and provides secretariat support for International Electrotechnical Commission (IEC) and International Organization for Standardization (ISO) committees that develop process measurement and control standards. To obtain additional information on the Society's standards program, please write:

ISA  
Attn: Standards Department  
67 Alexander Drive  
P.O. Box 12277  
Research Triangle Park, NC 27709

---

---

---

---

ISBN: 0-87664-343-8