

VERIS
Verabar[®]

Field Flow Systems

***Transmount[®] and
Mass Transmount[®]***

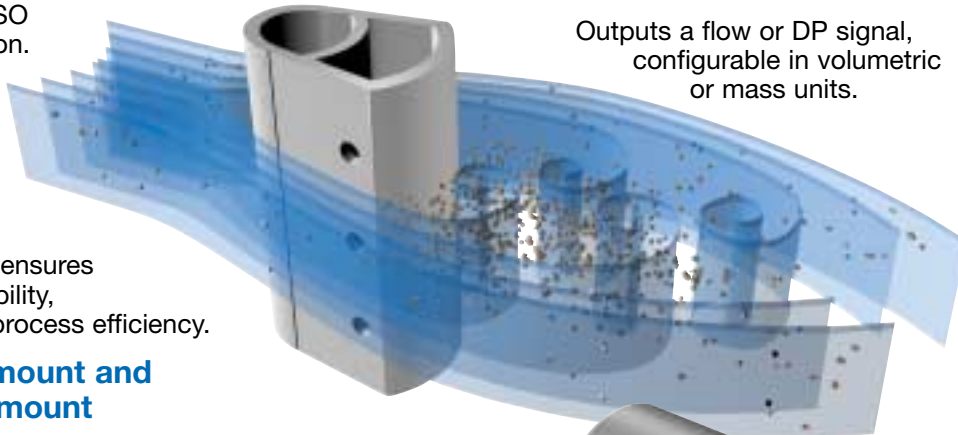


Verabar... A New Idea in Field Flow Systems

Veris Field Flow Systems

Accurate and dependable flow measurement begins in the pipe with the Verabar, the proven leader in dependability and accuracy. Its patented non-clog design, verified flow coefficients and solid one-piece construction are backed by a 5-year performance warranty and ISO 9001 certification.

The superior performance of the Verabar primary flow element and its companion DP transmitter ensures maximum reliability, accuracy and process efficiency.



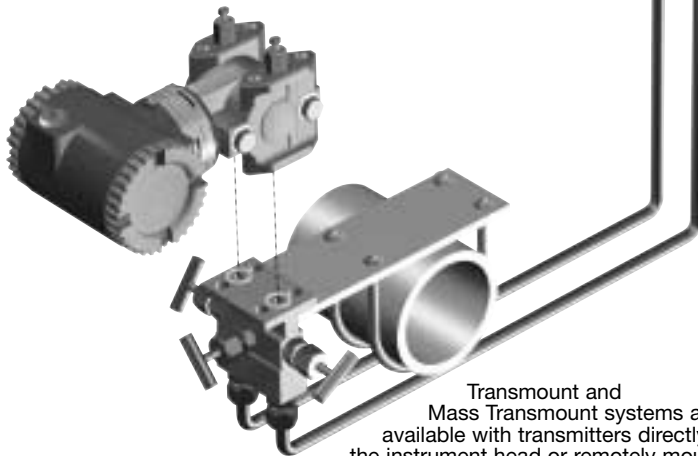
Veris Transmount and Mass Transmount

Veris Transmount & Mass Transmount field flow systems include:

- The Verabar flow sensor
- DP transmitter configured to your application, available in three types:
 - Economical and easy to use, push-button field configurable (no communicator required, upgradeable to fully intelligent version)
 - Fully intelligent transmitters, which outputs include Foxcom, Hart or Fieldbus
 - Multivariable transmitters that output pressure, temperature and a dynamically compensated flow signal
- Instrument valves, interchangeable standard manifold and RTD (as required)

For your records...the best documentation package in the industry

- Flow calculation (determines DP based on your flowing conditions)
- Structural Calculation (when requested)
- Up and downstream straight run requirements
- Detailed Dimensional Drawings
- Installation Bill of Materials
- Installation Instructions

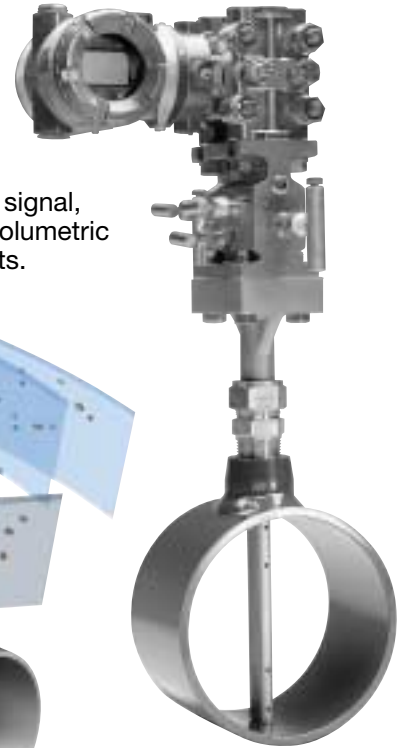


Transmount and Mass Transmount systems are available with transmitters directly mounted to the instrument head or remotely mounted as shown.

Transmount

A Transmount flow system is the first choice for all liquids, gas and steam applications.

Outputs a flow or DP signal, configurable in volumetric or mass units.



Mass Transmount

A Mass Transmount flow system should be selected on steam and gas applications with variable temperature and pressure.

A Multivariable transmitter with integral or remote RTD measures pressure, temperature and DP to calculate a dynamically compensated flow rate. The integral RTD design requires only a single pipe penetration which lowers installation costs by 50%.

Veris Application Assistance

If you have any questions or need assistance in determining which system to select and the effects on system accuracy, contact Veris through **FASTER** (Factory Assisted Sales and Technical Response). See details on Page 11.



How to Select a Veris Field Flow System

How to Order information, specifications and documentation on following pages.

Transmount

Non-Compensated Pressure and Temperature

All liquids, gas and steam applications with constant or minor changes in pressure or temperature.

Mass Transmount

Compensated Pressure and Temperature

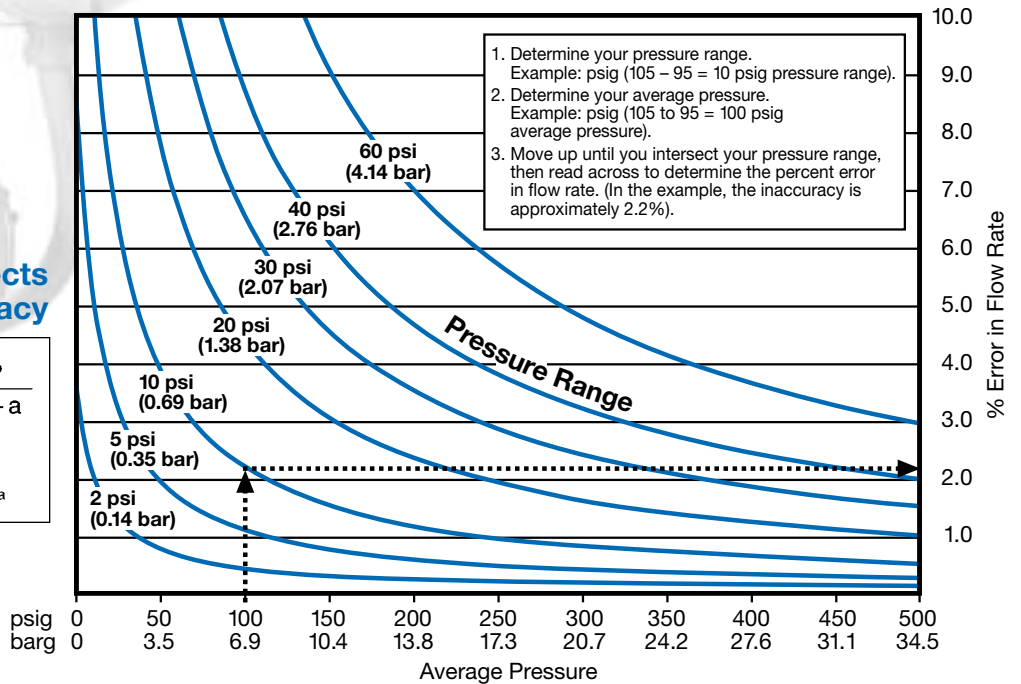
Gas and steam applications with major changes in pressure and/or temperature.

The first step is to determine the effects of the variations in pressure and temperature on your system accuracy. The equations and charts below can be used to determine the percent error in flow rate due to variations in pressure and temperature. If the accuracy is within acceptable limits, select the lower cost Transmount; if not, select Mass Transmount.

Pressure Effects on Accuracy

$$\% Q_{\text{Error}} = \frac{25 \Delta P}{P_{\text{avg gage}} + a}$$

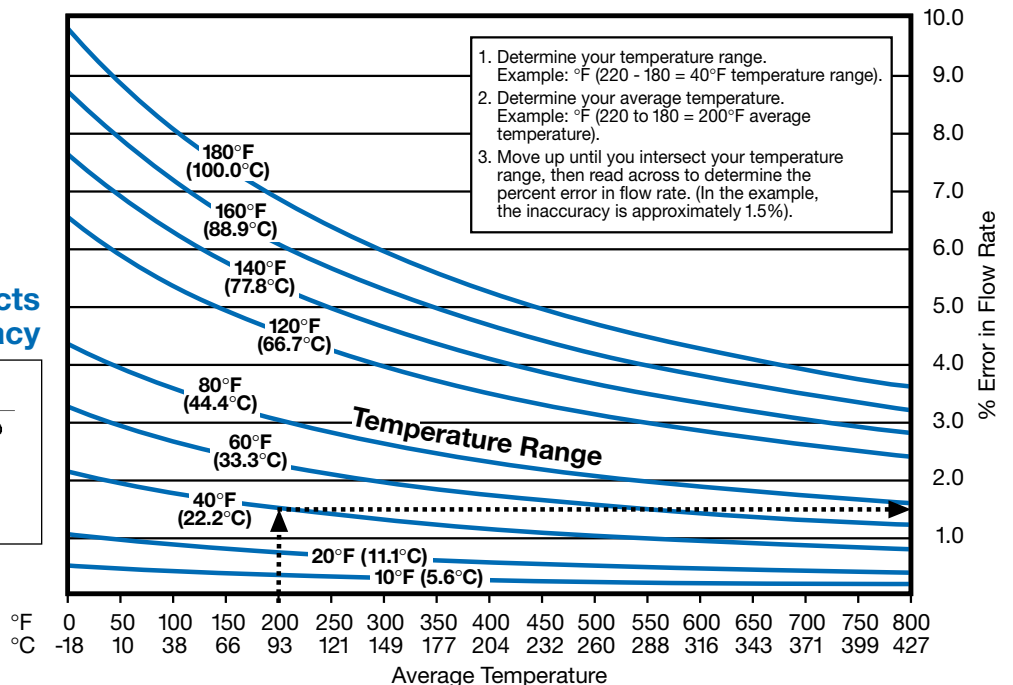
a = 14.73 for PSI
a = 101.32 for K_{Pa}



Temperature Effects on Accuracy

$$\% Q_{\text{Error}} = \frac{25 \Delta T}{T_{\text{avg}} + b}$$

b = 460 for °F
b = 273 for °C



How to Order

Quick & Easy Specifications

1. Select a Transmount or Mass Transmount System and transmitter installation location (remote or direct mount) from the chart below.
2. Complete the Quick Flow System Selection (opposite page). Veracal will complete the model numbers and furnish flow calculations, drawings, complete specifications and quotations.

Complete Catalog Specifications

Select each system component:

Transmount —	Page
• Remote mount (TR)	6
• Direct mount (TD)	7
Mass Transmount —	
• Remote mount (MRI, MRS)	8
• Direct mount (MDI, MDS)	9

	Transmount® (Regular Transmitter)	Mass Transmount® (Multivariable Transmitter)	
	Outputs DP or flow $Q = C' \sqrt{DP}$	Outputs DP, pressure, temperature and calculates a dynamic compensated flow rate at the transmitter $Q = C' \sqrt{\frac{DP \times P}{T}}$	
Remote Mount	 Code TR	 Code MRI Requires only a single pipe penetration	 Code MRS Separate RTD and Thermowell Facilitates RTD calibration and maintenance
	 Code TD	 Code MDI Requires only a single pipe penetration	 Code MDS Separate RTD and Thermowell Facilitates RTD calibration and maintenance

Specifications	Transmount	Mass Transmount
System Accuracy	± 1.0% @ constant T&P	± 1.3% @ variable T&P
Pressure	ANSI 600# (max)*	
Temperature	Remote Mount 800°F (max)*	Direct Mount Limited by the DP transmitter**
* Model and component selection must be verified by Veracalc (Flow & Structural Calculation Program)		
** Process: -40°F to +250°F (-40°C to +121°C) Ambient: -40°F to +185°F (-40°C to +85°C)		

Notes:

1. Instrument tubing and fittings are not included.
2. Each system is shipped pre-configured and ready to install.

VERIS Verabar® Quick Flow System Selection

Fill in the form below, complete sections **1** through **7** and fax to: **303-652-8552**

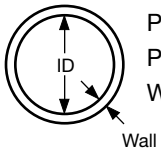
VERIS, inc. 6315 Monarch Park Place
Niwot, CO 80503 USA

Phone: 303-652-8550
Fax: 303-652-8552

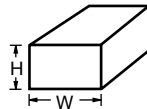
E-Mail: contact@veris-inc.com
Website: www.veris-inc.com



1. Enter Pipe Dimensions or Duct Dimensions



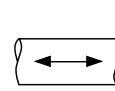
Pipe Size _____ Sch _____
Pipe ID _____ and
Wall _____ Pipe Mat'l _____



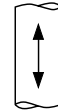
Dimension
Verabar spans
(H) or (W)

Height (H) _____
Width (W) _____
Wall _____
Duct Mat'l _____

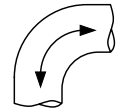
2. Pipe or Duct Orientation



(H) Horizontal



(V) Vertical

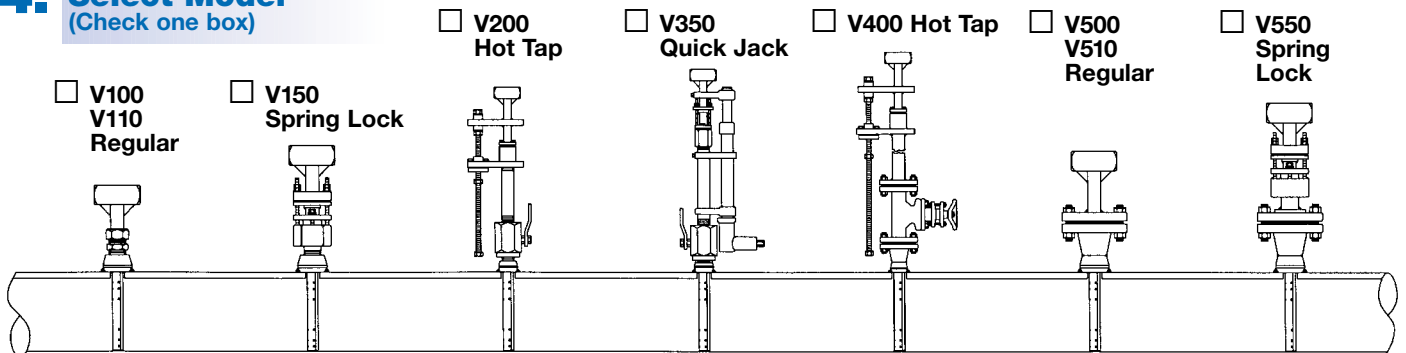


Short
Straight Run
Consult Factory

3. Enter Flow Conditions

Fluid Name:		Maximum	Normal	Minimum	Units	Special Instructions
Flow Rate						
All Fluids	Pressure @ Flow					
	Temperature @ Flow					
Gas	Specific Gravity, or					
	Molecular Weight					
Liquid	Specific Gravity					
Steam	Veracalc Program can calculate Density from Temperature and Pressure					

4. Select Model (Check one box)



5. System Code

Transmount	<input type="checkbox"/> Remote (TR) or <input type="checkbox"/> Direct (TD)	_____
Mass Transmount — Integral RTD	<input type="checkbox"/> Remote (MRI) or <input type="checkbox"/> Direct (MDI)	_____
— Thermowell & RTD	<input type="checkbox"/> Remote (MRS) or <input type="checkbox"/> Direct (MDS)	_____

6. Select Manifold

Number of Valves	Material
<input type="checkbox"/> 3	<input type="checkbox"/> CS
<input type="checkbox"/> 5	<input type="checkbox"/> SS

7. Select Transmitter

Indicator	Output	Approvals
<input type="checkbox"/> Yes	<input type="checkbox"/> 4-20mA	Explosion-Proof: <input type="checkbox"/> FM <input type="checkbox"/> CSA <input type="checkbox"/> CENELEC
<input type="checkbox"/> No	<input type="checkbox"/> Digital Hart/4-20mA	Intrinsic Safety: <input type="checkbox"/> FM <input type="checkbox"/> CSA <input type="checkbox"/> CENELEC
	<input type="checkbox"/> Other	

8. Veris or your local representative will complete the Verabar specifications

A Flow calculation to determine the DP, select the instrument head and valves and verify the application.

Complete documentation will be furnished with a quotation or order, including:

- Flow calculation
 - Installation bill of materials
 - Submittal drawing
 - Straight run requirements
- (See pages 10 and 11)

Transmount, Remote Mount (TR)

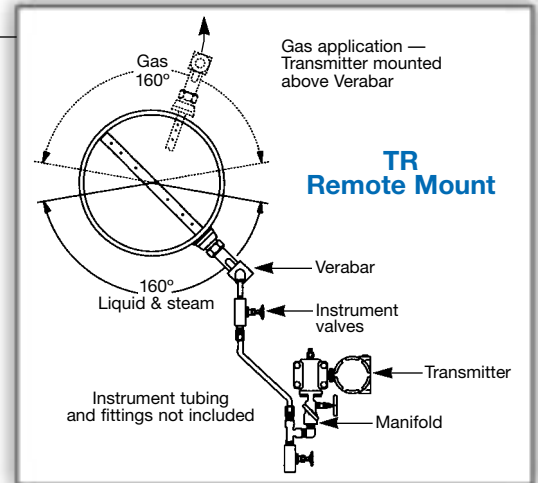
Output — DP (Linear or Square Root)

How to order

1. Select complete Verabar model from Veracalc Flow Calculation Program or Product Specification Sheet.
2. Select type of Field Flow System.
3. Select instrument valves & manifold.
4. Select transmitter.

Veris will:

1. Verify the application.
2. Configure the transmitter.
3. Ship the system ready to install.



Select Verabar Model from Veracalc Flow Calculation or Verabar Catalog														
V100, V110, V150, V200, V250, V350, V400, V450, V500, V510, V550														
<div style="display: flex; justify-content: space-around;"> ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ </div>	Code	Type Field Flow System												
	TR	Transmount, Remote Mount												
	Code	Instrument Valves (P & R Heads only)												
	C2NC	Needle, CS												
	C2NS	Needle, SS												
	C2GC	Gate, CS, Steam Applications												
	C2GS	Gate, SS, Steam Applications												
	N	None Required												
	Code	Manifold, Flanged x 1/2" NPT												
	T3SC	3 valve	CS	Soft Seat, Derlin										
	T3SS		SS											
	T3HC	3 valve	CS	Hard Seat, Metal										
	T3HS		SS											
	T5SC	5 valve	CS	Soft Seat, Derlin										
	T5SS		SS											
	T5HC	5 valve	CS	Hard Seat, Metal										
	T5HS		SS											
	N	None Required												
	Transmitter													
	Code	Transmitter Output												
MA	4-20 mA													
HT	Digital Hart/4-20mA													
Code	Approvals													
FX	FM Explosion-Proof Approval													
FS	FM Explosion-Proof & Intrinsic Safety													
CX	CSA Explosion-Proof Approval													
CS	CSA Explosion-Proof & Intrinsic Safety													
KX	CENELEC Flame-Proof													
KS	CENELEC Intrinsic Safety													
Code	Optional Meter													
LC	LCD Meter													
Code	Mounting Bracket													
M1	CS Painted													
M2	316SS													
Code	Differential Pressure (DP) Range													
DP	Veris or your representative will select the transmitter DP range based on your application													
Code	Transmitter Manufacturer													
SV	Selection by Veris													
SC	Selection by customer — designate a manufacturer's name in space below													
<i>Example</i>														
V100	8"/40	10	H	R	TR	C2NS	T3SS	HT	FX	LC	M1	DP	SC	Catalog Number
Verabar Model					System	Valves	Manifold	Transmitter						

Transmount, Direct Mount (TD)

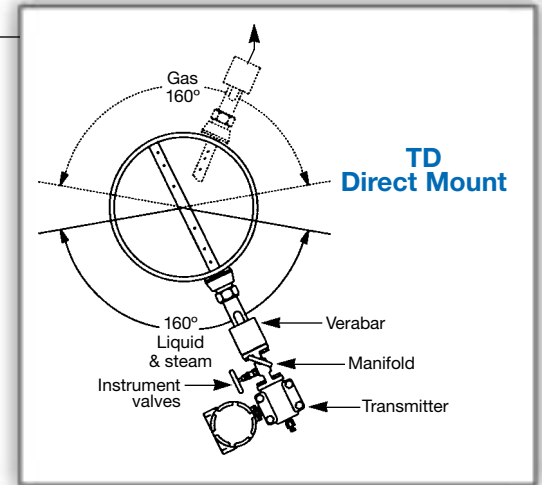
Output — DP (Linear or Square Root)

How to order

1. Select complete Verabar model from Veracalc Flow Calculation Program or Product Specification Sheet.
2. Select type of Field Flow System.
3. Select manifold.
4. Select transmitter.

Veris will:

1. Verify the application.
2. Configure the transmitter.
3. Ship the system ready to install.



Select Verabar Model from Veracalc Flow Calculation or Verabar Catalog
V100, V110, V150, V200, V250, V350, V400, V450, V500, V510, V550

Code	Type Field Flow System		
TD	Transmount, Direct Mount		
Code	Manifold, Flanged x Flanged		
F3SC F3SS	3 valve	CS	Soft Seat, Derlin
		SS	
F3HC F3HS	3 valve	CS	Hard Seat, Metal
		SS	
F5SC F5SS	5 valve	CS	Soft Seat, Derlin
		SS	
F5HC F5HS	5 valve	CS	Hard Seat, Metal
		SS	
N	None Required		
Transmitter			
Code	Transmitter Output		
MA	4-20 mA		
HT	Digital Hart/4-20mA		
Code	Approvals		
FX	FM Explosion-Proof Approval		
FS	FM Explosion-Proof & Intrinsic Safety		
CX	CSA Explosion-Proof Approval		
CS	CSA Explosion-Proof & Intrinsic Safety		
KX	CENELEC Flame-Proof		
KS	CENELEC Intrinsic Safety		
Code	Optional Meter		
LC	LCD Meter		
Code	Differential Pressure (DP) Range		
DP	Veris or your representative will select the transmitter DP range based on your application		
Code	Transmitter Manufacturer		
SV	Selection by Veris		
SC	Selection by customer — designate a manufacturer's name in space below		

Example

V100	8"/40	10	H	F	TD	F3SS	HT	FX	LC	DP	SC		Catalog Number
Verabar Model					System	Manifold	Transmitter						

Mass Transmount, Remote Mount (MRI & MRS)

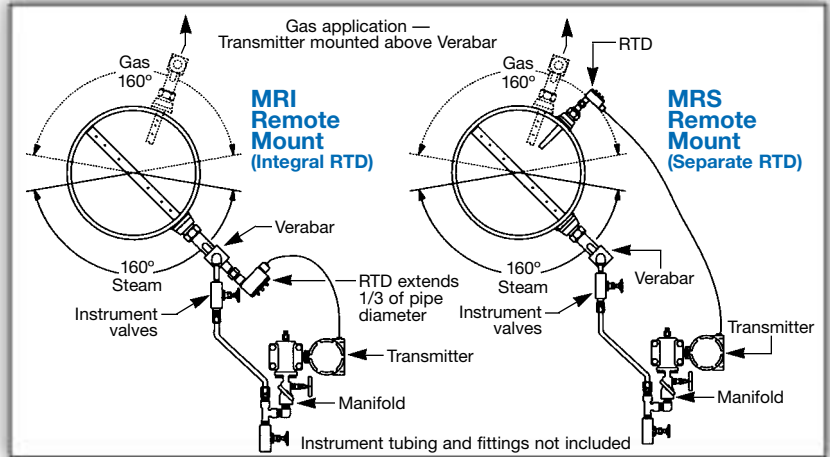
Multivariable Transmitter Output — Compensated Flow, DP, Pressure & Temperature

How to order

1. Select complete Verabar model from Veracalc Flow Calculation Program or Product Specification Sheet.
2. Select type of Field Flow System.
3. Select instrument valves & manifold.
4. Select transmitter.

Veris will:

1. Verify the application.
2. Configure the transmitter.
3. Ship the system ready to install.



Select Verabar Model from Veracalc Flow Calculation or Verabar Catalog
V100, V110, V150, V200, V250, V350, V400, V450, V500, V510, V550

Code	Type Field Flow System	
MRI	Remote Mount, Integral RTD	
MRS	Remote Mount, Separate RTD	
Code	Instrument Valves (P & R Heads only)	
C2NC	Needle, CS	
C2NS	Needle, SS	
C2GC	Gate, CS, Steam Applications	
C2GS	Gate, SS, Steam Applications	
N	None Required	
Code	Manifold, Flanged x 1/2" NPT	
T3SC T3SS	3 valve	CS Soft Seat, Derlin
		SS Hard Seat, Metal
T3HC T3HS	3 valve	CS Hard Seat, Metal
		SS Hard Seat, Metal
T5SC T5SS	5 valve	CS Soft Seat, Derlin
		SS Hard Seat, Metal
T5HC T5HS	5 valve	CS Hard Seat, Metal
		SS Hard Seat, Metal
N	None Required	
Transmitter		
Code	Transmitter Output	
MA	4-20 mA	
HT	Digital Hart/4-20mA	
Code	Approvals	
FX	FM Explosion-Proof Approval	
FS	FM Explosion-Proof & Intrinsic Safety	
CX	CSA Explosion-Proof Approval	
CS	CSA Explosion-Proof & Intrinsic Safety	
KX	CENELEC Flame-Proof	
KS	CENELEC Intrinsic Safety	
Code	Optional Meter	
LC	LCD Meter	
Code	Mounting Bracket	
M1	CS Painted	
M2	316SS	
Code	Differential Pressure (DP) Range	
DP	Veris or your representative will select the transmitter DP range based on your application	
Code	Transmitter Output	
SV	Selection by Veris	
SC	Selection by customer — designate a manufacturer's name in space below	

Example

V100	8"/40	10	H	R	MRS	C2NS	T3SS	HT	FX	LC	M1	DP	SC		Catalog Number
Verabar Model					System	Valves	Manifold	Transmitter							

Mass Transmount, Direct Mount (MDI & MDS)

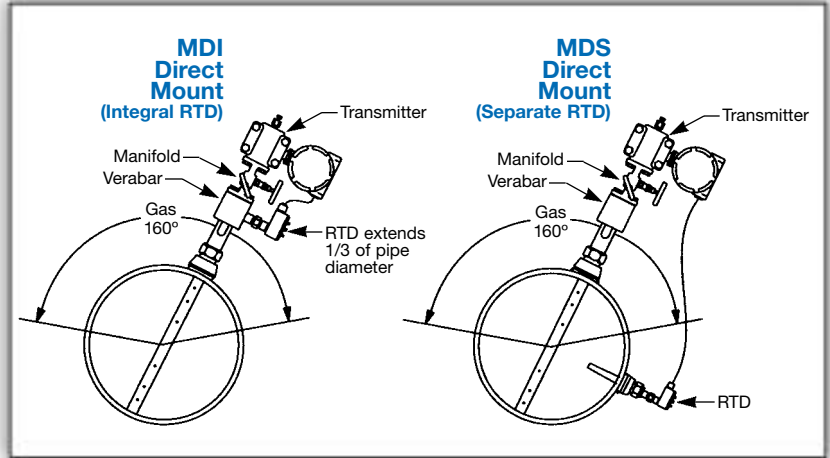
Multivariable Transmitter Output — Compensated Flow, DP, Pressure & Temperature

How to order

1. Select complete Verabar model from Veracalc Flow Calculation Program or Product Specification Sheet.
2. Select type of Field Flow System.
3. Select manifold.
4. Select transmitter.

Veris will:

1. Verify the application.
2. Configure the transmitter.
3. Ship the system ready to install.



Select Verabar Model from Veracalc Flow Calculation or Verabar Catalog

V100, V110, V150, V200, V250, V350, V400, V450, V500, V510, V550

Code	Type Field Flow System
MDI	Direct Mount, Integral RTD
MDS	Direct Mount, Separate RTD
Code	Manifold, Flanged x Flanged
F3SC F3SS	3 valve CS SS Soft Seat, Derlin
F3HC F3HS	3 valve CS SS Hard Seat, Metal
F5SC F5SS	5 valve CS SS Soft Seat, Derlin
F5HC F5HS	5 valve CS SS Hard Seat, Metal
N	None Required
Transmitter	
Code	Transmitter Output
MA	4-20 mA
HT	Digital Hart/4-20mA
Code	Approvals
FX	FM Explosion-Proof Approval
FS	FM Explosion-Proof & Intrinsic Safety
CX	CSA Explosion-Proof Approval
CS	CSA Explosion-Proof & Intrinsic Safety
KX	CENELEC Flame-Proof
KS	CENELEC Intrinsic Safety
Code	Optional Meter
LC	LCD Meter
Code	Differential Pressure (DP) Range
DP	Veris or your representative will select the transmitter DP range based on your application
Code	Transmitter Manufacturer
SV	Selection by Veris
SC	Selection by customer — designate a manufacturer's name in space below

Example

V100	8"/40	10	H	F	MDS	F3SS	HT	FX	LC	DP	SC		Catalog Number
Verabar Model					System	Manifold	Transmitter						

Reliable Verabar® Installations

The best documentation package ensures the system is installed and operating right...the first time.

Flow Calculation

Calculates the Verabar DP based on your flowing conditions; DP is used to size and configure the transmitter

VERIS Verabar. Model No.: V150-05-V-R Serial No.: V4800-01.1 Tag Info.: FE-3456

Pipe Size: 4.0 in SCHED 40 ID: 4.026 in. Wall: 0.237 in Process: Feed Water

Power Conversion
Customer: 123-2001
Customer PO: Steven Maurer
Processed By: V4800
Veris Ref.: 14 Sep. 2001
Process Date: test4.vfc
File Name: test4.vfc
Fluid Name: Water

Flow Calculation
VeraCalc 2000 Ver. 1.0

I. Flow Equation
Actual Volumetric Flow Rate for Liquids
 $Q_v = C' \sqrt{h_w}$ $h_w = \left[\frac{Q_v}{C'} \right]^2$
 $C' = \frac{NKD^2}{\sqrt{\rho}}$

II. Constants

Term	Description	Value	Units
N	Numeric Constant	0.757487	
K	Flow Coefficient	0.7345	
D	Internal Pipe Diameter	4.026	in

III. Flowing Conditions

Term	Description	Maximum	Nominal	Minimum	Units
Q_v	Actual Volumetric Flow Rate	150.0000	100.0000	50.0000	CFM
T_f	Temperature at Flow	200.000000	60.000	60.000	°F
P_f	Pressure at Flow	1.00000000	200.000000	200.000000	PSI
ρ	Density	9.018067	1.00000000	1.00000000	S.G. @100°
C'	Flow Constant		9.018067	9.018067	
h_w	Differential Pressure		122.963	30.7407	in H2O

IV. Sensor Structural Limits

Term	ANSI Eq.	at User's Maximum	Ultimate Maximum	Limiting Factor
Max Temp	ANSI 600	800.0 °F at 200.0 PSIG	800.0 °F at 960.0 PSIG	Sensor
Max Pres	ANSI 600	1440.0 PSIG at 60.0 °F	1440.0 PSIG at 100.0 °F	Sensor

Maximum Allowable Flow Rate: 177.7 CFM (388.1 in H2O)

V. Notes

Structural Calculation

Verifies the structural integrity of the sensor at the flowing conditions

VERIS Verabar. Model Information

Model No.: V150-05-V-R Tag Info.: FE-3456 Serial No.: V4800-01.1

Customer: 123-2001 Customer PO: Steven Maurer File Name: test4.vfc Power Conversion: test4.vfc

Structural Calculation

Dimensions

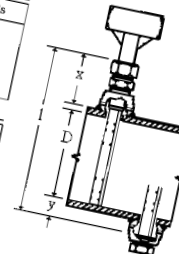
Term	Description	Value	Units
D	Internal pipe diameter	4.026	in
t	Pipe Wall Thickness	0.237	in
x	Unsupported length	6.093	in
y	OD to support point	1.830	in
	OD to opposite support	0.000	in

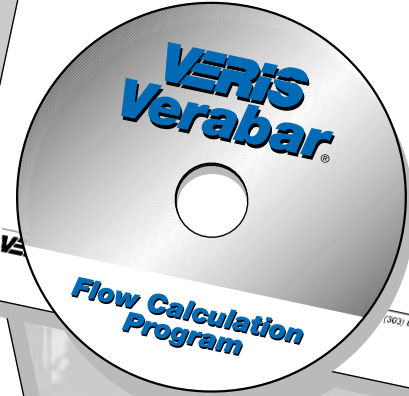
Maximum Allowable

Term	Description	Value	Units
V_{max}	Maximum allowable velocity	33.496	feet/sec
Q_{max}	Maximum allowable flow rate	177.6990	CFM
P_{max}	Maximum allowable differential pressure	388.147	in H2O
C'_{max}	Sensor lift coefficient (ANSI B31.1)	15700.0	PSI
C'_r	Sensor lift coefficient (nonresonant)	5.6	

At Resonance

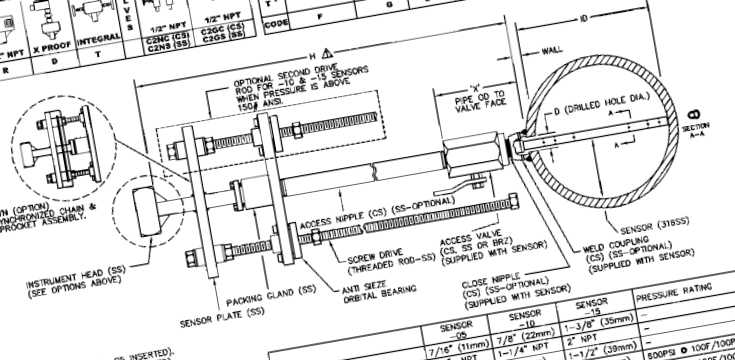
Term	Description	Value	Units
V_r	Velocity at resonance	46.430	feet/sec
Q_r	Flow rate at resonance	246.2785	CFM
P_r	Differential pressure at resonance	745.808	in H2O
σ_r	Stress at resonance	30978.3	PSI
C'_r	Lift coefficient at resonance	5.6	
f_r	Natural (resonant) frequency	663.3	Hertz





PARALLEL **REGULAR** **BTD** **VALVE** **INTEGRAL** **NEEDLE** **GATE** **TRANSOMOUNT** **MANIFOLD** **5-VALVES**

CODE P R D T K C20G (CS) C20G (SS) 1/2" NPT C20G (CS) C20G (SS) 12" NPT C20G (CS) C20G (SS) F D E M



NOTES:
1. H=(D+WALL)+X+10.2" (SENSOR -10 INSERTED).
H=(D+WALL)+X+11.6" (SENSOR -10 INSERTED).
H=(D+WALL)+X+3.6" (SENSOR -15 RETRACTED).
H=(D+WALL)+X+11.4" (SENSOR -10 RETRACTED).
H=(D+WALL)+X+11.4" (SENSOR -15 RETRACTED).
H=(D+WALL)+X+13.2" (SENSOR -10 SYNCHRO DRIVE).
H=(D+WALL)+X+13.2" (SENSOR -15 SYNCHRO DRIVE).
ADD 1.5" TO "H" FOR -10 SYNCHRO DRIVE.
ADD 1.75" TO "H" FOR -15 SYNCHRO DRIVE.
2. INSTRUMENT HEAD AND ACCESS VALVE ORIENTATION FOR SHOWN 90 DEGREES FROM ACTUAL ORIENTATION FOR CLARITY.

ITEM	SENSOR	SENSOR	SENSOR	PRESSURE RATING
	-10	-10	1-3/8" (35mm)	-
SENSOR DIA.	7/16" (11mm)	7/8" (22mm)	1-3/8" (35mm)	-
COUPLING SIZE	3/4" NPT	1-1/4" NPT	2" NPT	-
DIM "D" DRILLED HOLE DIAMETER	1/2" (13mm)	1" (26mm)	1-1/2" (38mm)	800PSI @ 100F/100PSI @ 400F
DIM "X" FOR BRONZE BALL VALVE	5.6" (142mm)	7.2" (183mm)	9.1" (231mm)	1000PSI @ 100F/200PSI @ 400F
DIM "X" FOR CS BALL VALVE	6.2" (157mm)	7.7" (196mm)	9.1" (231mm)	1000PSI @ 100F/200PSI @ 400F
DIM "X" FOR SS BALL VALVE	6.2" (157mm)	7.7" (196mm)	10.1" (257mm)	ANSI CLASS 900
DIM "X" FOR CS GATE VALVE	6.2" (157mm)	7.7" (196mm)	8.8" (224mm)	1200PSI @ 100F/800PSI @ 800F
DIM "X" FOR SS GATE VALVE	6.2" (157mm)	7.7" (196mm)	8.8" (224mm)	1200PSI @ 100F/800PSI @ 800F

* "X" & "Y" DIMENSIONS ARE APPROXIMATE (FOR SIZING PURPOSES ONLY).

VERIS, inc.
6315 MONARCH PARK PLACE
NIWOT, CO 80503
PHONE: 303-652-8550
FAX: 303-652-8552

VERABAR MODEL: V200 SINGLE & DOUBLE ROD THREADED
DATE: 09/20/01
SCALE: NTS
REV A
SUB-3936
PAGE 1 OF 1

Dimensional Drawing

Defines the model, dimensions and tolerances



Installation Bill of Materials

A complete list of the materials required to install the Verabar based on the fluid (gas, liquid or steam)

Installation Instructions

Complete written and illustrated installation instructions

VERIS Verabar.

Differential Pressure Flow Sensors

Installation Instructions

V100, V110 Compression Fitting
V150 Spring Lock

1.0 SCOPE

These instructions provide a description of procedures for installing the V100 Verabar flow sensor. Procedures are given for all industrial flow measurement applications including liquid, steam and gas service for both horizontal and vertical piping configurations.

2.0 RECEIVING INSPECTION

- The following tasks should be performed as part of the receiving inspection procedure:
 - Check items received against the packing list.
 - Check sensor nameplate for proper model number, serial number and customer number.
 - Verify that the actual pipe diameter matches the ID stated on the sensor nameplate.
 - Check the bullet shaped sensor tube for any signs of damage. Damage to the sensor tube may result in erroneous flow readings.
 - Check the round cover tube for any damage, especially axial gouges or scratches. Damage to the cover tube may prevent the ferrule from seating properly.

3.0 SAFETY PRECAUTIONS

- The following tasks should be conducted prior to installing the Verabar flow sensor:
 - Check maximum operating conditions on the sensor nameplate and verify that they exceed the

- maximum conditions of the installation. If any pressure, temperature or flow limits will be exceeded consult the factory before proceeding.
- Check that the pipe is depressurized and drained prior to installation. If installation under pressure is desired, refer to the Verabar catalog for information on the V200, V360 and V400 Hot Tap models.
- Check that all pressure containing components are properly installed and tightened prior to pressurizing the system.

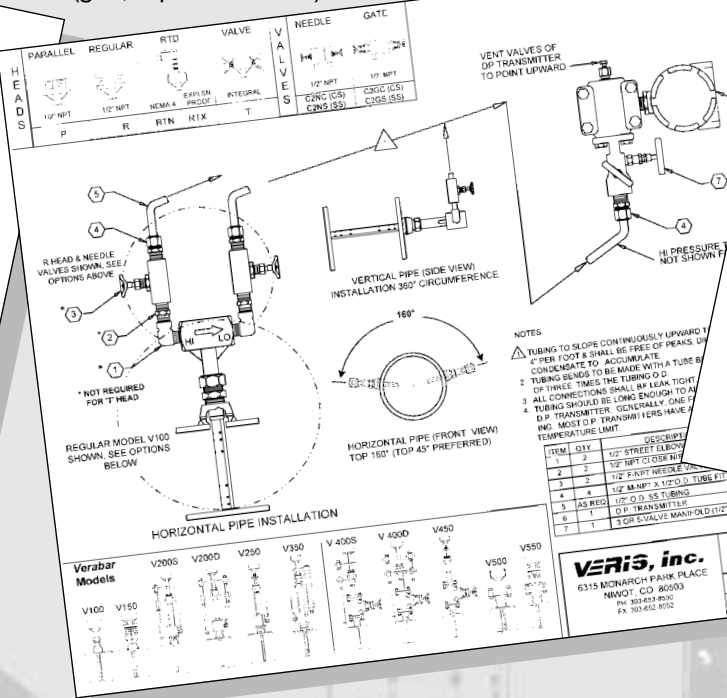
4.0 INSTALLATION PREPARATIONS

4.1 Location
For the most accurate flow measurement, a minimum straight run of pipe is required. Table 1 shows the minimum straight run requirements. If longer straight runs are available, position the Verabar such that the ratio of upstream straight run to downstream straight run is approximately 4 to 1. If straight run lengths are less than the values stated in Table 1, consult the factory for additional accuracy and location information.

Position straightening vanes such that the end closest to the Verabar is half way between the Verabar and the closest upstream obstruction. For elbow installations, upstream elbow

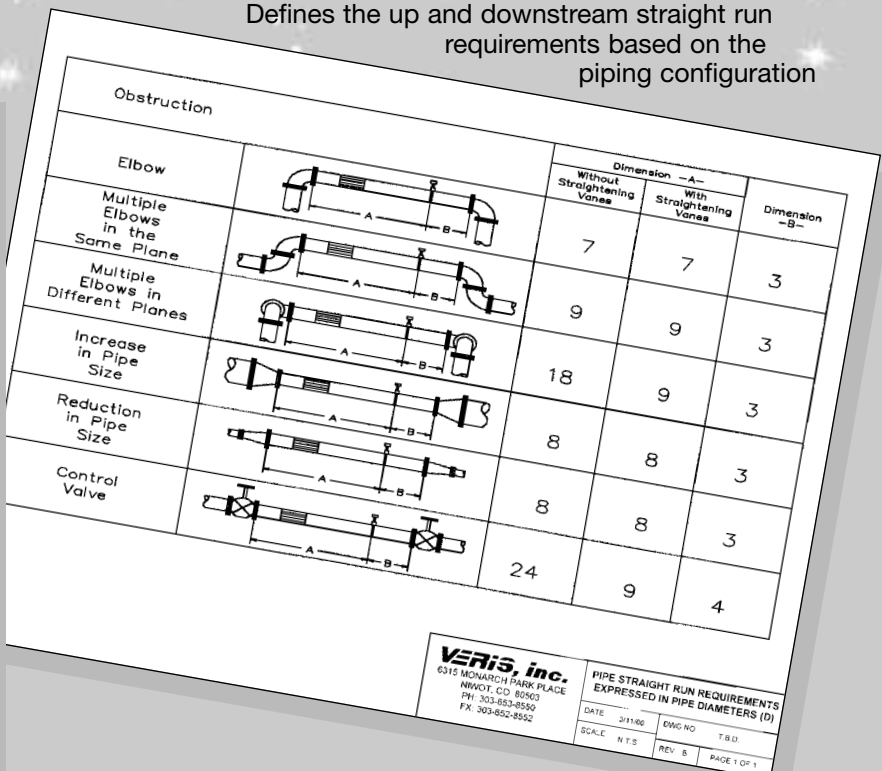
Obstruction	Dimension -A-		
	Without Straightening Vanes	With Straightening Vanes	Dimension -B-
Elbow	7	7	3
Multiple Elbows in the Same Plane	7	7	3
Multiple Elbows in Different Planes	9	9	3
Increase in Pipe Size	18	9	3
Reduction in Pipe Size	8	8	3
Control Valve	8	8	3
	24	9	4

Table 1. Straight Run Requirements



Up and Downstream Straight Run

Defines the up and downstream straight run requirements based on the piping configuration



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