Fluid.iO
SENSING FLUID EXCELLENCE

MARIMEX® ViscoScope®

INLINE VISCOMETER

for improved process quality

Fluid.iO
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Our know-how in viscosity measurement is your competitive advantage

Viscosity is our passion. Combined with our extensive know-how, we help you to further **improve the quality of your processes**.

Our customers face global competition and can only continue to be successful if they **properly utilize the competitive advantages** that present themselves.

As a german manufacturer of measuring instruments for viscosity measurement, we offer you a measuring system that we have developed ourselves and that has proven itself in practice, enabling you to **control and optimize the quality of your manufacturing processes**.

For all questions regarding viscosity measurement we are competently at your side as a technology partner and with our worldwide sales network.

Our experienced sales team is looking forward to your inquiry!

German Producer

Global Supplier

Benefit from our many years of experience in viscosity measurement.

Increase your process quality and avoid short fall batches

Inconsistent product quality and faulty batches can often be traced back to unnoticed changes in process conditions. MARIMEX® can help you **avoid the resulting losses in sales and earnings**.

Precise measurement technology enables you to achieve higher quality in the process. **Viscosity is an excellent process parameter** for this purpose.

With our ViscoScope® measuring system, you can easily and reliably measure viscosity directly in your process and in real time. **Use the newly generated knowledge to optimize and control your manufacturing process**.

> *Viscosity is an excellent parameter for maximizing process quality.*

Maximize your yield and save costs

With a inline process viscometer from MARIMEX®, you only use as much raw material and energy in your process as you actually need for the desired product.

Our innovative measuring instrument supports you as a user in **optimal process control**.

You can use the measurement results, for example, to **control the dosing quantities and mixing ratios** or to regulate the temperature of your manufactured product.

Maintenance-free measurement technology that accelerates your process

Additional measurement instrumentation often leads to plant shutdown and thus complete production downtime, due to planned or unplanned maintenance.

With our **ViscoScope® sensor** you take no risk. After the installation you can use the maintenance-free measuring device that is calibrated with special shear-independent calibration oils without additional maintenance.

Your production is up and running at all times with maximum process reliability.

> *For batch and continuous processes in almost all industrial applications.*

CONVINCING PRODUCT FEATURES

robust stainless steel housing
completely welded
flexible installation positions
precise & reproducible measurement results
suitable for Ex- and Non-Ex areas

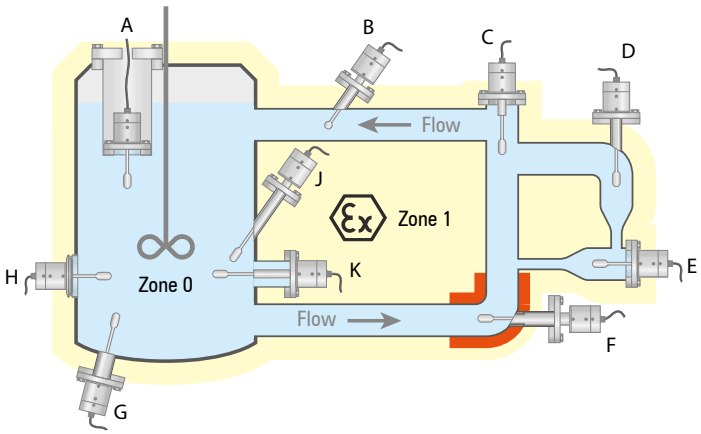
MARIMEX® SYSTEM FOR INLINE VISCOSITY MEASUREMENT

ViscoScope® Sensors for various applications

ViscoScope® Transmitter

Find further product information on our website:

www.marimex.de



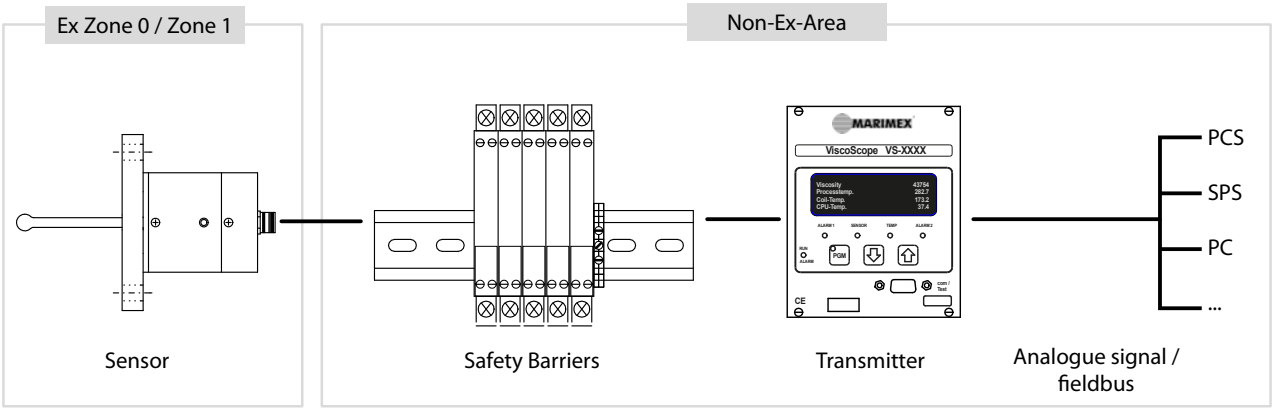
Typical installation positions for our measuring device

Easy integration and commissioning

You can integrate the **viscosity sensor with evaluation unit** into your new and existing systems without much effort.

With our suitable accessories, you can easily measure the viscosity in almost any application directly in the process.

Even in the case of a process-related modification of your production line, you can continue to use the sensor system.



Typical system design for installation in Ex-Area

» Integration into existing process control systems is possible. «

Bring the test laboratory to the machine

Our measuring system permanently protocols important process conditions at the location of operation for you, which you can use for **documentation and control purposes**. Save a lot of time and bring the laboratory to your machine. This way you **reduce the number of submissions to laboratories** and other testing facilities.

Rely on viscosity as a quality parameter and leave the competition behind you

Together with our application engineers, you will find out how you can use viscosity measurement in your very specific application to increase process quality.

We have already carried out a large number of successful installations of our measuring system for a large international customer base.

Chemical Industry

- ✓ Dosing of paints and varnishes
- ✓ Addition of solvents to adhesives and sealants
- ✓ Coatings for paper
- ✓ Optimization of cement mixtures
- ✓ Production of polymer melts

Petrochemical Industry

- ✓ Asphalt & Bitumen Mixtures
- ✓ Control of oil bunkering process
- ✓ Flow measurement in pipelines
- ✓ Measurement of the flowability of lubricants

Pharma & Cosmetics

- ✓ Shape stability of creams & lotions
- ✓ Filling of shampoo & toothpaste
- ✓ Stiffness of gelatin capsules
- ✓ Final viscosity of herbal extractions

Food Industry

- ✓ Blending of binders
- ✓ Addition of raw materials in baked goods
- ✓ Dosing of water in frozen goods
- ✓ Mixing of spices
- ✓ Filling of spreads & sauces
- ✓ Drying of animal feed products

Start using MARIMEX® ViscoScope® today

Inline viscosity measurement with MARIMEX® ViscoScope® takes your processes to a new level.
Get on board now and **be in no way inferior to your competitors**.

... and many many more satisfied customers

Your benefits at a glance

- ✓ You obtain new insights into your production or manufacturing process
- ✓ You avoid faulty production & faulty batches
- ✓ You increase the quality and process safety in your production
- ✓ You monitor the quality parameter viscosity permanently & directly in the process
- ✓ You use a modern, maintenance-free measuring system with very high measuring accuracy & reproducibility

MARIMEX® is the optimal partner for your process

- ✓ We are specialist for inline viscosity measurement with 25 years of experience
- ✓ Our engineers support you in planning, installation as well as in the interpretation of the measured values
- ✓ "Made in Germany" - We produce in Germany and deliver worldwide
- ✓ We offer customer service and support worldwide in many industrial nations

Find a qualified distributor near by you

We work together with selected distributors trained by us.

This enables us to recommend you a local sales partner in many places around the world who can help with questions about inline viscosity measurement with **ViscoScope®** from **MARIMEX®**.

Our Services

We support you from the application-specific consultation to the customer-specific device. You will receive competent support from us during the installation of your measuring device. You and your employees will be trained by us on site in the use of the measuring system and for the interpretation of the measured values.

ADVICE ON THE APPLICATION

COMMISSIONING SUPPORT

USER TRAINING

Official Distributor:

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*** MARIMEX® & ViscoScope® are brands of Fluid.iO**

TB-Viskosimeter_13032023_ANHU

MARIMEX® ViscoScope® VA-100

In-line Process viscometer

- ✓ Reproducible measurement of viscosity in real time
- ✓ Optimisation of production / quality assurance
- ✓ Maintenance-free measuring instrument
- ✓ Dead space free installation (CIP / SIP capable)
- ✓ Cost-effective
- ✓ Chemicals, petrochemicals, food, pharmaceuticals and cosmetics

Ex Approval

Condition monitoring

Inline Sensor

German Producer Global Supplier

Technical data

Properties

Sensor type	C: Cylinder B: sphere
Probe dimensions	C: Ø 32 x 145 mm B: Ø 32 x 120 mm
Material	1.4571 / 1.4404 (316 Ti / 316L)
Protection class	IP65
Process connection	NPT thread | Special flange | Varivent® | Tri-Clamp
Cable length	Max. 1,000 metres
Reproducibility of the display value	C: ± 0,3% or ±1 Digit B: ±0,5& or ± 1 Digit
Accuracy of the display value	±2% or ±1 Digit
Ex-area (optional)	II 1/2G Ex ia IIC T6…T3 Ga/Gb

Operating conditions

Process temperature	-10…+130 °C
Pressure	Vacuum up to 64 bar, depending on installation
Installation	Position-independent in tanks, pipelines, flow cells
Flow velocity	up to 5 m/s, depending on installation

Measuring ranges

Viscosity range in mPa·s x g/cm³	C: 0,1…2.500 B: 10…25.000

General description

The ViscoScope® sensor VA-100 is a maintenance-free process viscometer for precise, reproducible and reliable real-time measurement of the dynamic viscosity of liquids. A Pt100 integrated in the sensor simultaneously measures the process temperature. The ViscoScope® system is factory calibrated with certified Newton calibration oils.
The sensor is available in two probe versions. There is a choice of NPT threads and Special flange or hygienic fittings. Standardised or specially developed flow cells also allow installations in pipelines with small cross-sections.

Functionality

The ViscoScope® sensor probe is fully welded so that no moving parts come into contact with the fluid being measured. Electric coils excite the sensor at its resonant frequency to oscillate in low amplitude torsion.There is a fast PID controller in the transmitter which keeps the amplitude constant, i.e. the higher the viscosity becomes, the greater the voltage, which is a measure of the dynamic viscosity in mPa-s x g/cm3 (η x ρ). The low amplitude at resonance frequency prevents material fatigue so that no parts can misalign or wear out.

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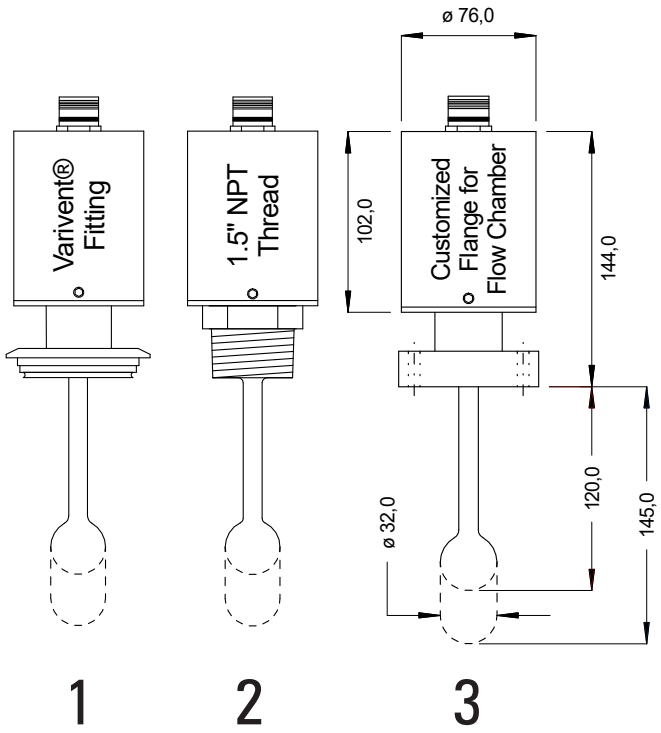
Fluid.iO SENSING FLUID EXCELLENCE

MARIMEX® ViscoScope® VA-100

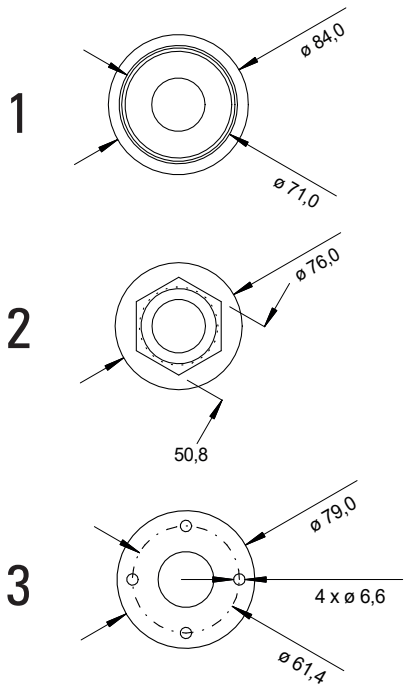
Dimensional Drawing

Dimensioning in mm

Side view



Front view



Applications

- ✓ in continuous and batch processes
- ✓ Shortening and optimising mixing processes
- ✓ Adding solvents to coating systems
- ✓ Controlling the medium temperature for constant viscosity

model code

Basic designation

Viscosity range
C = 0,1...2.500 mPas* g/cm³
B = 10...25.000 mPas* g/cm³

Temperature range
LT = -40…130 °C

Process connection
N = NPT
V = Varivent®
T = Tri-Clamp
S = Special flange Ø 80 x 20 mm for Flow cell DZ101

Material
VA = 1.4571/1.4404 (316Ti/316L)

Ex-area (optional)
Ex = II 1/2G Ex ia IIC T6…T3 Ga/Gb

VA-100 ☐☐☐☐☐☐

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MARIMEX® ViscoScope® VA-300

Process viscometer

- ✓ Reproducible measurement of viscosity in real time
- ✓ Optimisation of production / quality assurance
- ✓ Maintenance-free measuring instrument
- ✓ Easy integration into existing systems
- ✓ for very low & high viscosities, temperatures & pressures
- ✓ Chemicals, petrochemicals, food, pharmaceuticals and cosmetics

Approval

Condition monitoring

Inline Sensor

Technical data

Properties

Sensor type	L: large cylinder M: small cylinder H: sphere X: mini sphere
Probe dimensions	L: Ø 32 x 190 mm M: Ø 32 x 165 mm H: Ø 32 x 130 mm X: Ø 32 x 115 mm
Material	Stainless steel (for others see model code)
Protection class	IP65
Process connection	Flange | Fitting | Thread (see model code)
Cable length	Max. 1,000 m
Reproducibility of the display value	L | M : ± 0,3% or ±1 Digit H | X : ±0,5% or ± 1 Digit
Accuracy of the display value	±2% or ±1 Digit
Ex-area (optional)	II 1/2G Ex ia IIC T6…T3 Ga/Gb

Operating conditions

Process temperature	-40… +450 °C
Pressure	Vacuum up to 450 bar
Installation	Position-independent in tanks, pipelines, flow cells
Flow velocity	up to 10 m/s, depending on installation

Measuring ranges

Viscosity range in mPa·s x g/cm³	L: 0,1…2.500 M: 1…25.000 H: 10…250.000 X: 100…2.500.000

General description

The ViscoScope® sensor VA-300 is a maintenance-free process viscometer for precise, reproducible and reliable real-time measurement of the dynamic viscosity of liquids. A Pt100 integrated in the sensor simultaneously measures the process temperature. The ViscoScope® systems are factory calibrated with certified Newtonian calibration oils.
The sensor is available with different probes and process connections. With this variety of sensor design, modifications to potential installation locations can often be avoided or adapted with little effort.

Functionality

The ViscoScope® sensor probe is fully welded so that no moving parts come into contact with the fluid being measured. Electric coils excite the sensor at its resonant frequency to oscillate in low amplitude torsion. There is a fast PID controller in the transmitter which keeps the amplitude constant, i.e. the higher the viscosity becomes, the greater the voltage, which is a measure of the dynamic viscosity in mPa-s x g/cm3 (η x ρ). The low amplitude at resonance frequency prevents material fatigue, so that no parts can become misaligned or worn - the best prerequisites for a maintenance free, long-lasting and reliable measuring instrument.

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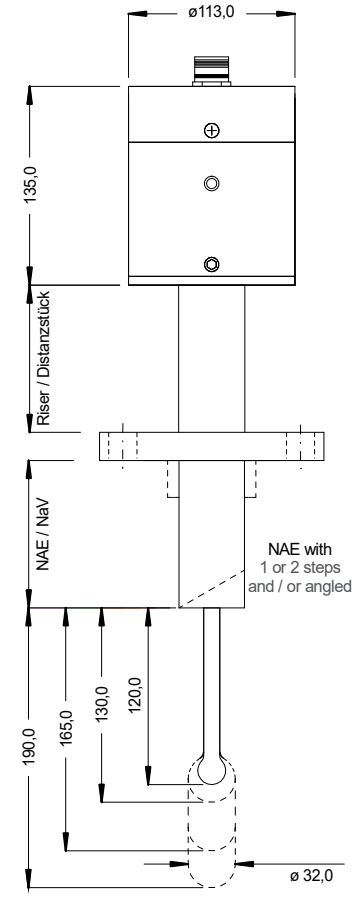
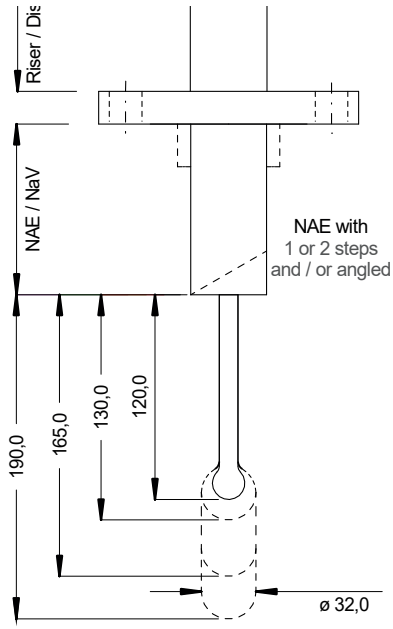
MARIMEX® ViscoScope® VA-300

Dimensional Drawing

Dimensioning in mm



A



A

Typekey

Basic designation

Viscosity range
- **L** = 0,1...2.500 mPas* g/cm³
- **M** = 1...25.000 mPas* g/cm³
- **H** = 10...250 Pas* g/cm³
- **X** = 100...2.500 Pas* g/cm³
- **S** = Special design, application-specific

Temperature range
- **LT** = -40…130 °C
- **ST** = -40…300 °C with inert gas cooling depending on installation
- **HT** = -40…450 °C with inert gas cooling depending on installation

Process connection
- **DIN** = Flange according to EN 1092-1, please Specify dimensions
- **ANSI** = Flange according to ASME B16.5, please specify dimensions
- **N** = NPT
- **V** = Varivent®
- **T** = Tri-Clamp

Material
- **VA** = Stainless steel (1.4571/1.4404 316Ti/316L)
- **DU** = Duplex SAF2205 (1.4462)
- **HC** = Hastelloy C22 (2.4602)
- **FPC** = Fluoropolymer Coating (non-stick-coating)

Non-active extension :
- **NaV** = with non-active extension

Ex-area (optional)
- **Ex** = II 1/2G Ex ia IIC T6…T3 Ga/Gb

VA-300 ☐☐☐☐☐☐☐

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MARIMEX® ViscoScope® D250/4450

Transmitter

Display Unit

Condition monitoring

Transmitter for process viscometer

- ✓ Compatible with all ViscoScope® sensors
- ✓ Panel or field mounting
- ✓ Process documentation via 4-20 mA / fieldbus
- ✓ Local display (4-line display)
- ✓ Div. calculable parameters

Technical data

Properties

Display	4-line alphanumeric - 2 pages
Outputs	RS232 output on the front, MODBUS RTU (standard)
Outputs optional	0/4...20 mA or 0/2...10 VDC (active) RS232 or RS485 / 2 SPDT relays RS232 or RS485 (note type code)
Output card socket	4450: 4 D250: 2
External input	0/4…20 mA or 0/2…10 V DC
Transmitter operation	3 buttons on the front
Filter	Moving average (up to 200 measured values)
Alarms	System function, sensor diagnosis, coil temperature, 2 adjustable LEDs
Power supply	4450: 95…250 VAC 50…60 Hz, 15 W ,| 24 V AC / VDC D250: 24V DC, 12 W
Dimensions	4450: 19"-Standard 3HE 21TE x 180 mm D250: 142 x 106 x 73 mm (L x B x H)

Operating conditions

Measurement parameters	Viscosity, Process Temperature, Coil Temperature, External Input, Resonance Frequency
Calculable parameters	Temperature compensation, Dynamic viscosity, Kinematic viscosity, User viscosity
Ambient temperature	0…50 °C

General description

The ViscoScope® transmitters of the VS-4450 and VS-D250 series are compatible with all ViscoScope® sensors of the types VA-300 and VA-100 and their predecessor models.
The transmitter excites the sensor and keeps the amplitude of the sensor's resonance frequency constant with fast PID control. The internal resolution is 16 bits, so that viscosity ranges over 4 decades are also excellently covered.
Both transmitters are equipped with a configurable display. The transmission of the measurement data is done via analogue or serial interfaces in industry standard. The model VS-4450 is also available with 2 SPDT relays, which allow time-proportional control or alarms.

Installation and assembly

The transmitter VS-4450 is designed in 19" standard and can therefore be installed in all suitable housings. The model VS-D250 is designed for mounting on a DIN rail. With an adapter, wall mounting as well as installation in a wall or Ex-d enclosure is possible.

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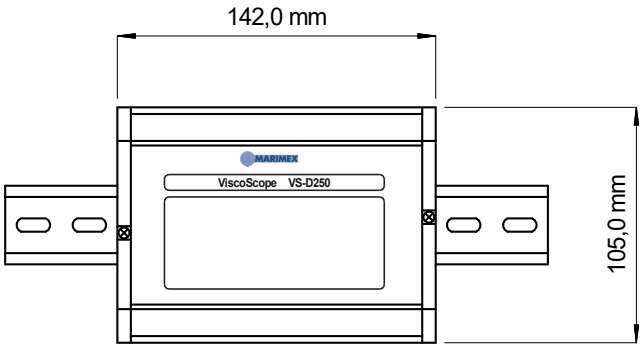
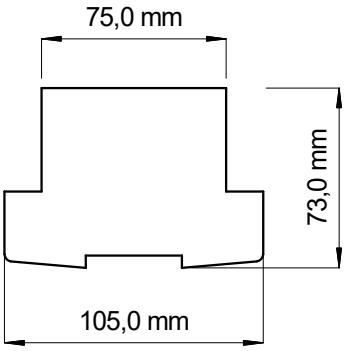
ViscoScope® D250/4450

Dimensional Drawing

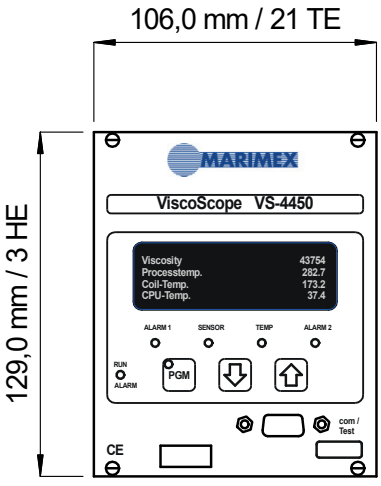
Dimensioning in mm

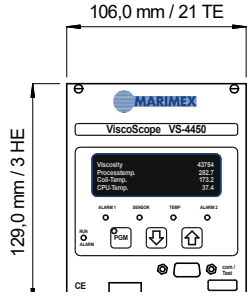
VS-D250





VS-4450





model code

Basic designation

Outputs (2 output card sockets)
1 = 1x 0/4...20 mA or 1x 0/2...10V DC (active)
2 = 2x 0/4...20 mA or 1x 0/2...10V DC (active)
RTU = 1x RS485 (Modbus RTU)
1RTU = 1x 0/2...10V DC (active) or 1x 0/4...20 mA and 1x RS485 (Modbus RTU)

Power supply
24D:= 24V DC

Housing
DG = DIN rail housing, IP42
ExG: = Ex d enclosure

VS-D250 ☐☐☐☐

Basic designation

Outputs (4 output card sockets)
1 = 1x 0/4...20 mA or 1x 0/2...10V DC (active)
2 = 2x 0/4...20 mA or 1x 0/2...10V DC (active)
3 = 3x 0/4...20 mA or 1x 0/2...10V DC (active)
RTU = 1x RS485 (Modbus RTU)
1RTU = 1x 0/2...10V DC (active) or 1x 0/4...20 mA and 1x RS485 (Modbus RTU)
2RTU = 2x 0/2...10V DC (active) or 2x 0/4...20 mA and 1x RS485 (Modbus RTU)
3RTU = 3x 0/2...10V DC (active) or 3x 0/4...20 mA and 1x RS485 (Modbus RTU)
REL = relay board with 2 SPDT-relays

Power supply
24A:= 24V AC
24D:= 24V DC
250:= 95…250 V AC

Housing
SG = Control panel housing (255 x 170 x 300 mm)
ExG = Ex d enclosure
WG = Wall-mounted enclosure, IP65
19 = 19" Rack, 3U 84HP

VS-4450 ☐☐☐☐

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Application datasheet

to specify your ViscoScope® viscometer

Date:

Project:

Contact

Company / Location:

Contact person:

Department / Function:

Phone / Email:

Fluid

Fluid to be measured:

Viscosity (Unit: Min: Max: Normal:

Under which conditions has the viscosity been measured? Viscometer: Temperature: Shear rate:

Fluid characteristics: Solids in %: Shear-thinning: ☐

Solids size: Shear-thickening: ☐

Other: Newtonian: ☐

Process

Process temperature (°C) Min: Max: Normal:

Process pressure (bar) Min: Max: Normal:

What is the measuring task and what is your target, respectively?

Measuring point

Which installation do you prefer? (Please have a look on page 2) A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H ☐ J ☐ K ☐ Others (please describe):

Preferred process connection Flange type / size: Others:

Further requirements Hazardous area: ☐ Sanitary installation: ☐

If installation in **reactor** Capacity: Stirrer type: Stirrer speed (rpm):

If installation in **pipe** Inner-Ø (mm): Pump type: Flow rate (m/s):

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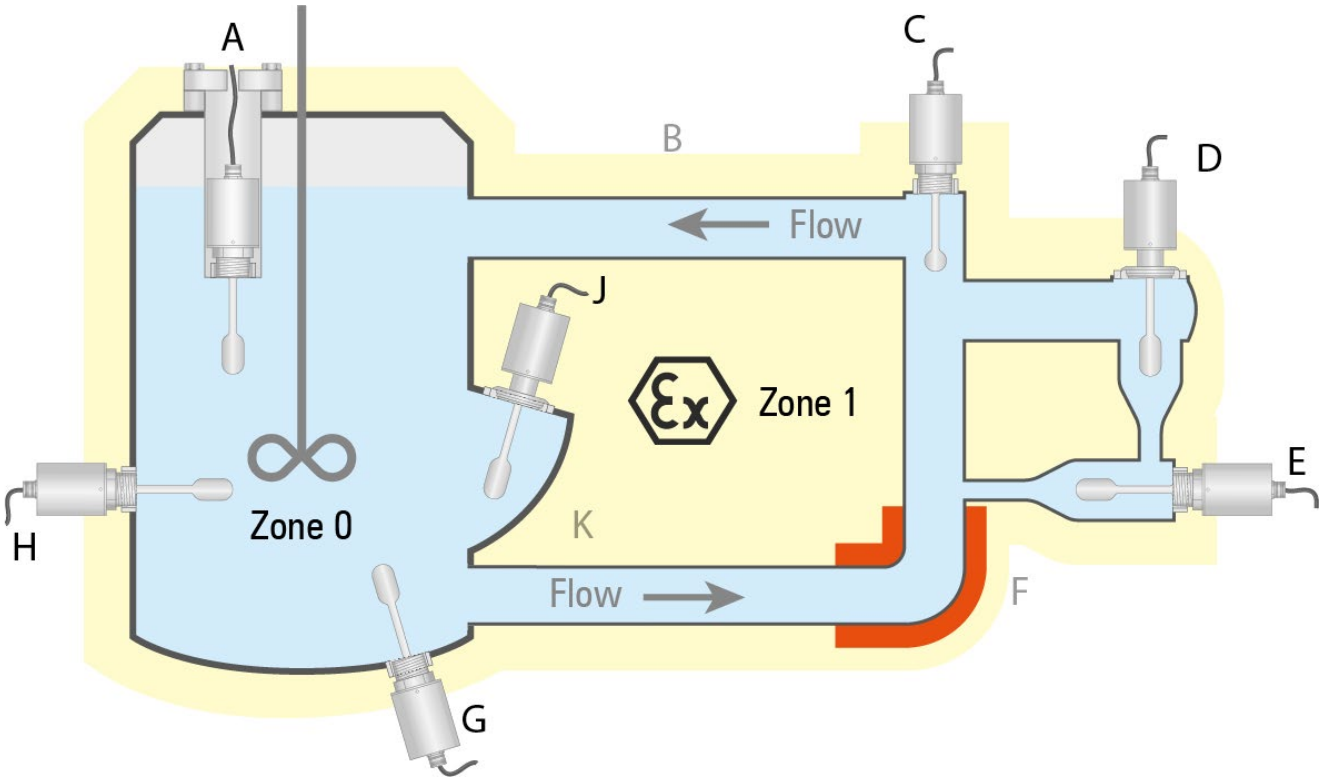
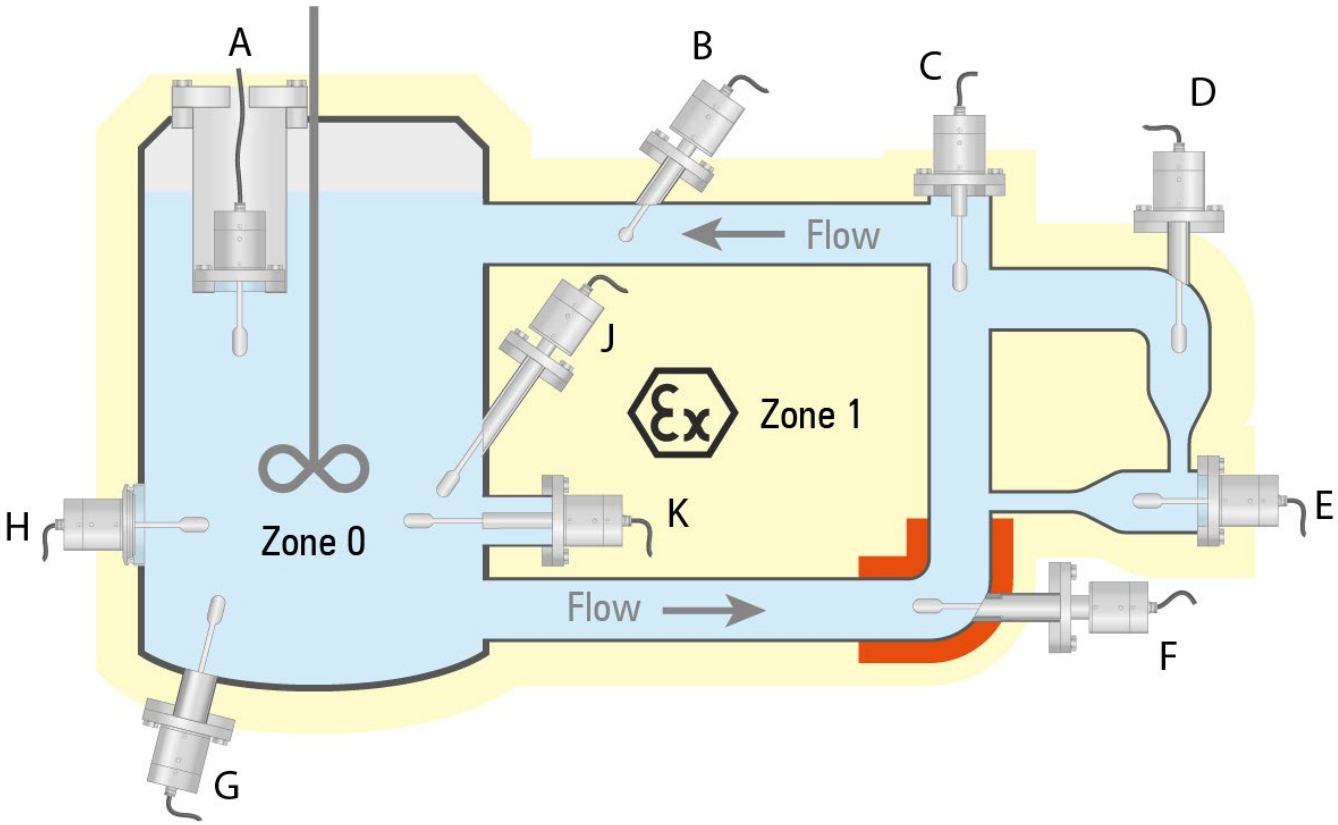
Installation Pattern VA-100



Installation Pattern VA-300



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