Rheology Solutions

Rheology Solutions is the sole Australian distributor of this product range and we welcome the opportunity of discussing your application requirements.

We hope the information you are seeking is contained within this file. If you have any questions, or require further information please contact us. We look forward to being of further service.

Regards from the Team at Rheology Solutions.

RHEOLOGY SOLUTIONS PTY LTD. ACN 082 479 632
HEAD OFFICE: 15-19 Hillside Street, Bacchus Marsh, Victoria 3340 Australia. PO Box 754, Bacchus Marsh, Victoria 3340 Australia.
Telephone: +61 3 5367 7477 **Facsimile:** +61 3 5367 6477 **Email:** info@rheologysolutions.com **Website:** www.rheologysolutions.com

Your process viscosity measurement solution

- Next generation viscosity transducers by Marimex and Viscotronics
- Proven in many applications and installations
- Torsionally vibrating sensor, no wearing parts
- Rugged, virtually no maintenance

Viscotronics Co., Ltd. info@viscotronics.com www.viscotronics.com

Marimex Industries Corp. info@marimex.com www.marimex.com

Company History

Marimex Industries Corp. was founded in Canada in 1984 selling and supporting a wide variety of analytical process instruments. 1993 Marimex started concentrating its efforts on torsional motion process viscometers and expanded operations.

With many successful installations in chemical, petrochemical, pharmaceutical and food applications, we have proven to be a reliable and safe partner to our customers. More than 25 years of experience with process viscosity applications help us to analyze the most difficult and demanding applications. Together with our customers we determine the measurement requirement and work on a constructive solution for the application. The selected instrument configuration will assure quick and effective results for the project.

If process parameters change, we are ready to support our customers by re-evaluating the application based on the new parameters. This enables current installations to be optimized. Continually changing requirements are used as an opportunity to improve our existing instrumentation.

Whilst especially sensor developments had been ongoing all along, there have been further developments since 2009, which significantly improve upon aspects of both the transducer and the transmitter. These developments were done independent of previous supplier and business partner relationships and therefore resulted in forming a new company in Thailand named Viscotronics Co., Ltd.

We continue to closely monitor customer demands and consider them part of our continuing development efforts. The systems introduced under the name ViscoTron make it possible to match special customer requirements with a variety of systems. Marimex and Viscotronics are ready to evaluate such customer requirements and provide solutions for your applications..

Transmitter timeline

1997
ViscoScope VS-2400

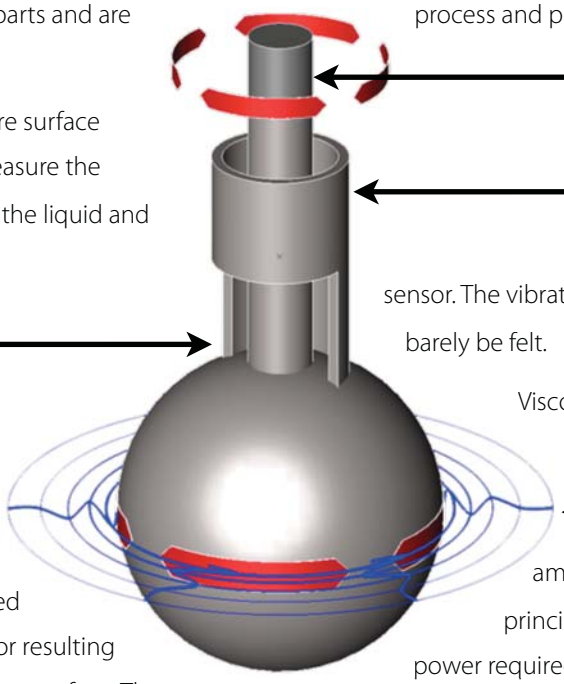
2003
ViscoScope VS-4450

2011
ViscoTron VT-G130

Operating principle

ViscoTron process viscometers measure the viscosity of liquids continually and precisely in-line. ViscoTron sensors have virtually no moving parts and are maintenance free.

Torsional oscillation viscometers are surface loading devices. These devices measure the viscosity at the interface between the liquid and the solid surface.



The sensor bulb twists back and forth at the sensors natural resonance. The drive shaft is welded to the sensor and moves the sensor resulting in a micron size motion at the sensor surface. The compliant sheath, which is also welded to the sensor and the opposing static plane, acts as a spring for the resonance. This completely welded construction hermetically seals the internal mechanism from the process and provides high integrity of the sensor. The vibration on the sensor surface can barely be felt.

ViscoTron sensors utilize a constant amplitude torsional oscillation principle to measure the viscosity. The power required to achieve the constant amplitude is a measure for the viscosity. This technology allows for the large range-ability of our ViscoTron systems.

Technology

ViscoScope and ViscoTron transmitters use different technologies.

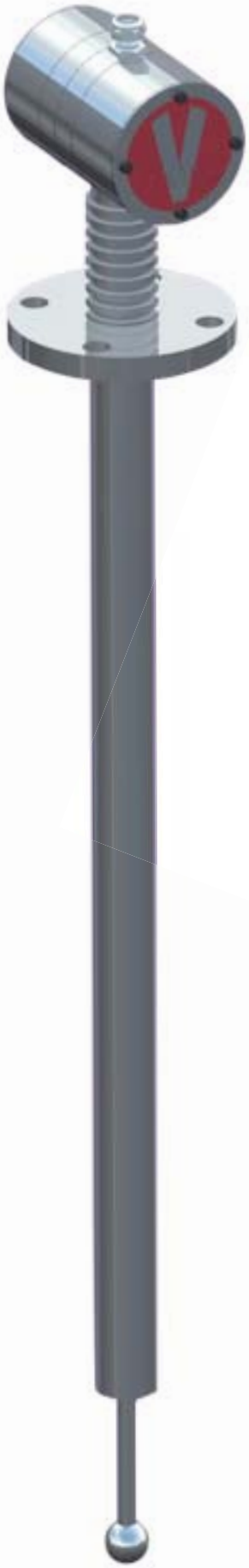
ViscoScope transmitters are a hybrid transmitter employing analog PID feedback control to maintain a constant amplitude on the sensor surface. The signal is then digitized and used in conjunction with the calibration curve to calculate the viscosity.

ViscoTron transmitters are direct digital drive transmitters and employ a kind of feed forward control to maintain a constant amplitude. A high powered processor enables the use of an algorithm with accurate frequency control, which at the same time follows and controls the sensors behavior. This technology mitigates influence from external influences like mechanical vibrations or electrical interference at the source instead of masking them with a filter later. Because the feed forward control signal is digitally generated it can be used to calculate the viscosity directly.

Dependent on the type of sensor and electronics used, the ViscoTron system can be applied in many processes. The total measurement range covered by ViscoScope and ViscoTron systems starts at 0.1 cP and ranges up to 5,000,000 cP. Optionally all sensors can be delivered with ATEX or CSA hazardous area approval.

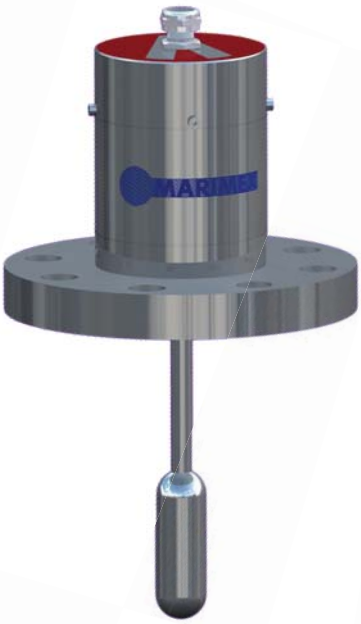
ViscoTron **Sensors**

some examples



VP-3000H with extra long extension
Air cooling not required

VP-3000M
Air cooling not required



ViP-300L

VP-300H with air cooling

VP-1000L

VP-2000H
Air cooling not required

ViscoTron **VP-3000**

The ViscoTron sensor series VP-3000 has been developed by Viscotronics using experience gained by Marimex over many years of sensor design, manufacture and customer experience. Customer requirements are often unconventional and the sensor design has to be able to adapt to those needs.

Innovative light guide assisted assembly allows the series VP-3000 sensor to be manufactured to match customer application requirements by using any length or shape of extension. The series VP-3000 is available in versions to measure low, medium, high or extra high viscosities. Sensors can be constructed for pressures up to 500 bar (7,250 psi) and temperatures up to 450˚C (840˚F). A PT100 inside the sensor bulb measures the temperature of the process. Calibration with Newtonian ASTM traceable fluids over 3 decades is standard with 4 decades optional.

These new generation sensors incorporate many new features, making them more flexible and easier to work with during installation, start-up and operation. They are designed to be adaptable to changing customer needs, without having to re-construct the sensor. The sensor is gravity independent and therefore can be mounted in any direction.

Specifications

Description	VP-3000L	VP-3000M	VP-3000H	VP-3000X
Viscosity range (mPa·s x g/cm^3)	0.00 to 2,500.00	0.0 to 25,000.0	0 to 250,000	0 to 5,000,000
Maximum process temperatures (no air cooling required)	with external transmitter < 175°C / 350°F < 350°C / 660°F < 450°C / 840°F		with internal transmitter < 75°C / 165°F <130°C / 265°F < 300°C / 570°F	
Accuracy	1% or ±1 digit (factory calibrated with NIST standards)			
Process temperature	Measured with PT100 located inside the sensor bulb			
Hazardous area approval (optional)	ATEX: II 1/2 G EEx ia IIC T3 – T6 CSA International Class I, Div I, Group C and D			
Wetted parts	SUS316L (1.4571) standard optionally Hastelloy C, Duplex, Monel and low friction corrosion resistant coatings			
Process connection	3" 300# and DN80 PN40 standard Other process connections optional (maximum pressure capability of sensor: 500 bar / 7250 psig)			
NAE (Non-active extension)	Eliminates no flow areas in a pipe connection, a reactor or T-piece. Can also be used to bridge gaps in low level applications.			

For complete specifications and model number selection request our VP-3000 specification sheet

ViscoTron **VP-300**

The ViscoTron sensor series VP-300 has been reinvented from the previous ViscoScope VA-300 sensor series. Whilst most of the customer familiar features and visible design elements have been left alone, the sensor internals have been changed to allow for different assembly procedures and placement of components like the PT100.

Innovative light guide assisted assembly allows the series VP-300 sensor to be manufactured to match customer application requirements by using different lengths or shapes for the extension. The series VP-300 is available in versions to measure low, medium, high or extra high viscosities. Sensors can be constructed for pressures up to 450 bar (6,500 psi) and temperatures up to 350˚C (660˚F). A PT100 inside the sensor bulb measures the temperature of the process. Calibration with Newtonian ASTM traceable fluids over 3 decades is standard with 4 decades optional.

These new generation sensors incorporate new features, which have been transferred from the other ViscoTron transducers.

Specifications

Description	VP-300L	VP-300M	VP-300H	VP-3000X
Viscosity range (mPa·s x g/cm^3)	0.00 to 2,500.00	0.0 to 25,000.0	0 to 250,000	0 to 5,000,000
Maximum process temperatures	< 130°C / 265°F < 175°C / 350°F < 350°C / 660°F		no air / no riser no air / riser air cooling / riser	
Accuracy	1% or ±1 digit (factory calibrated with NIST standards)			
Process temperature	Measured with PT100 located inside the sensor bulb			
Hazardous area approval (optional)	ATEX: II 1/2 G EEx ia IIC T3 – T6 CSA International Class I, Div I, Group C and D			
Wetted parts	SUS316L (1.4571) standard optionally Hastelloy C, Duplex, Monel and low friction corrosion resistant coatings			
Process connection	3" 300# and DN80 PN40 standard Other process connections optional (maximum pressure capability of sensor: 450 bar / 6500 psig)			
NAE (Non-active extension)	Eliminates no flow areas in a pipe connection, a reactor or T-piece. Can also be used to bridge gaps in low level applications. maximum length 300 mm / 12"			

For complete specifications and model number selection request our VP-300 specification sheet

ViscoTron **VP-2000**

The VP-2000 was developed by Viscotronics to combine the flexibility of the VP-3000 with the drive mechanism of the VP-1000 to provide a sensor, which will satisfy many process applications at a lower price point.

The same innovative LED assisted assembly procedures as used in the VP-3000 and VP-300 are also employed in the VP-2000. The series VP-2000 is available in versions to measure low, medium and high viscosities. Sensors can be constructed for pressures up to 40 bar (340 psi) and temperatures up to 275˚C (530˚F). A PT100 inside the sensor bulb measures the temperature of the process.

Calibration with Newtonian ASTM traceable fluids over 2 decades is standard with 3 decades optional.

The sensor is gravity independent and therefore can be mounted in any direction.

The neck (riser) is designed so that the sensor will work reliably without air cooling in process temperatures up to 175˚C (350˚F) or 275°C / 530°F respectively dependent on the length. This ensures that the the sensor is kept at the actual process temperature.

Specifications

Description	VP-3000L	VP-3000M	VP-3000H	VP-3000X
Viscosity range (mPa·s x g/cm^3)	0.00 to 2,500.00	0.0 to 25,000.0	0 to 250,000	0 to 5,000,000
Maximum process temperatures (no air cooling required)	with external transmitter < 175°C / 350°F < 275°C / 530°F		with internal transmitter < 75°C / 165°F <130°C / 265°F	
Accuracy	1% or ±1 digit (factory calibrated with NIST standards)			
Process temperature	Measured with PT100 located inside the sensor bulb			
Hazardous area approval (optional)	ATEX: II 1/2 G EEx ia IIC T3 – T6 CSA International Class I, Div I, Group C and D			
Wetted parts	SUS316L (1.4571) standard optionally Hastelloy C, Duplex, Monel and low friction corrosion resistant coatings			
Process connection	3" 300# and DN80 PN40 standard Other process connections optional (maximum pressure capability of sensor: 40 bar / 340 psig)			
NAE (Non-active extension)	Eliminates no flow areas in a pipe connection, a reactor or T-piece. Can also be used to bridge gaps in low level applications. maximum length 300 mm / 12"			

For complete specifications and model number selection request our VP-2000 specification sheet

ViscoTron **VP-1000**

The new generation VP-1000 sensor has been developed and reinvented using experience gained previously with the VA-100 series of sensors, which were sold by us under the name of Marimex for many years.

The VP-1000 has been designed for standard applications and yet can be adapted to customer process applications and connection requirements.

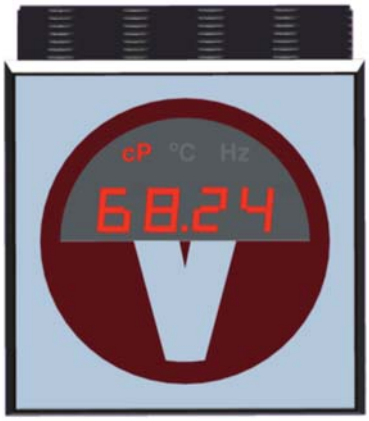
The series ViscoTron VP-1000 is available in versions capable of measuring low viscosities to high viscosities. For process pressures up to 10 bar / 150 psi and process temperatures up to 175ºC / 350ºF these sensors will fit many applications and can be easily adapted to OEM requirements.

Specifications

Description	VP-1000UL	VP-1000UM	VP-1000H
Viscosity range (mPa·s x g/cm^3)	0.0 to 1,000.0	0 to10,000	0 to 100,000
Sensor length	120 mm	100 mm	87 mm
Max process temperatures	with external transmitter < 130°C / 265°F 30 mm riser minimum < 175°C / 350°F riser only, no NAE		with internal transmitter < 75°C / 165°F
Accuracy	1% or ±1 digit (factory calibrated with NIST standards)		
Process temperature	Measured with PT100 located inside the sensor bulb or externally provided PT100		
Hazardous area approval (optional)	ATEX: II 1/2 G EEx ia IIC T3 – T6 CSA International Class I, Div I, Group C and D		
Wetted parts	SUS304 standard other materials or low friction, corrosion resistant coatings optionally		
Process connections	1" NPT, 2" 150# ASME or DN50 PN16 standard, sanitary flanges (maximum pressure capability of sensor: 10 bar / 150 psig)		
NAE (Non-active extension)	Eliminates no-flow areas in a pipe connection, a reactor or T-piece. Ø 28 to 34 mm / 1.1 to 1.3" Maximum length is dependent on process connection Examples: Using a 2" 150# ASME flange, the maximum NAE length is 37 mm / 1.3", with a 1" NPT connection the maximum length is 28 mm / 1.1"		

For complete specifications and model number selection request our VP-3000 specification sheet

ViscoTron and ViscoScope
Transmitters



ViscoTron **VT-G130**

The VT-G130 ViscoTron transmitter uses digital technology to directly drive ViscoTron or previous generation ViscoScope sensors. A high powered processor enables the use of an algorithm with accurate frequency control, which at the same time follows and controls the sensors behavior. This technology mitigates influence from external influences like mechanical vibrations and electrical interference at the source instead of masking them with a filter later. Internal storage and data capture allows the system to be used for remote data collection.

The VT-G130 transmitter is compatible both with our new generation ViscoTron VP-1000, VP-2000 and VP-3000 transducers as well as existing ViscoScope VA-300 and VA-100 transducers.

For general purpose applications the transmitter can be integrated into the sensor housing of the VP-1000, VP-2000 and VP-3000 transducers. For applications with high process temperatures separate stainless steel wall mount, DIN rail and panel mount housings are available. They can either be mounted close to or up to 300 meters away from the sensor.

Configuration of the VT-G130 can be done via 4 push buttons located below the display or alternatively with the VT-G130 Tool software, which runs on Windows XP or higher.

If the sensor is located in a hazardous area, safety barriers are used to establish ATEX approval. For these applications the transmitter can be mounted together with the barriers in an explosion proof housing eliminating the need for long specialized cables or up to 300 meters away from the sensor. The available approval rating for a complete system with safety barriers is: ATEX: II 1/2 G EEx ia IIC T3 – T6.

Specifications

Item	Description
Transmitter model	VT-G130
Technology	• Direct digital drive of the viscometer sensor • Feed forward control algorithm controls the sensor • Zero procedure algorithm eliminates mechanical and cable length influences • Compatible with all current ViscoTron and ViscoScope transducers
Measured parameters	• Viscosity • Process temperature (0.1°C) • Resonant frequency of sensor
Display	• 4 digit floating point bright LED display, display cycle between measured parameters is configurable • Identification of displayed parameters by backlit indicators
Outputs / Memory	• 1 only RS485 serial interface, Modbus protocol. USB interface cable included. • 2 only 4 to 20 mA analog outputs
Power supply	• 24 VDC
Ambient temperature	• 0 to 50°C / 0 to 122°F
Specifications for connection cable required between transmitter and transducer	• Four shielded twisted pairs with drain wire and overall shield • Maximum resistance per conductor10 Ω • Outside diameter 5 to 10 mm • Temperature range dependent on process requirements • Further detailed cable specs upon request

For complete specifications and model number selection request our VT-G130 specification sheet

ViscoScope **VS-4450**

The transmitter VS-4450 has an alphanumeric display, alarm LED's and 3 push buttons for configuration. The model VS-B450 has the same functionality as the VS-4450 but only has the watchdog timer single LED indicator. Both transmitters can be configured with a PC or optional graphical touch panel. For transmission of the measured parameters standard analog and serial outputs are available.

The transmitter can be located up to 1000 meters away from the sensor. If the sensor is located in a hazardous area, safety barriers will be used for either ATEX or CSA International approval. The available approval ratings for the complete system with safety barriers are: ATEX: II 1/2 G EEx ia IIC T3 – T6 and CSA International Class I, Div I, Group C and D

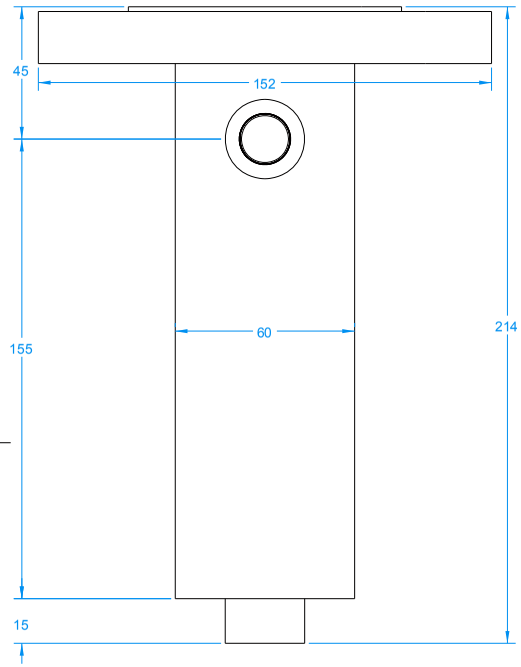
Specifications

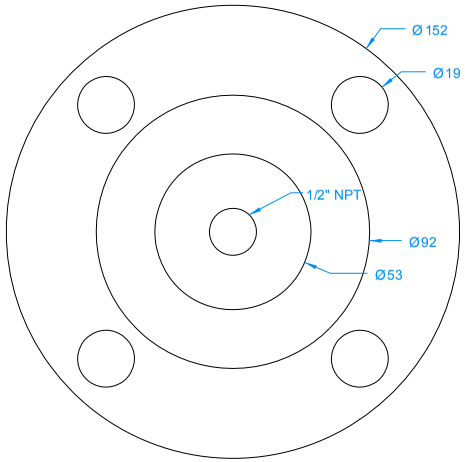
Item	Description
Transmitter model	VS-4450 and VS-B450
Technology	• Fast analog PID control loop for viscosity sensor • Compatible with all ViscoScope and ViscoTron sensors
Measured parameters	• Viscosity • Process temperature (0,1°C) of process, coils and microprocessor • Analog input for external signals • Resonant frequency for sensor diagnostics
Display	• 8-line alphanumeric display, divided into 2 pages • Each page configurable for a maximum of 4 parameters
Outputs	• 1 integrated front panel RS232 output, Modbus protocol • 4 slots for a maximum of 3 analog outputs (4 to 20 mA) and 1 serial output (RS485) or 4 analog outputs • 2 SPDT Relays, configurable for alarm parameters
External input	• 1 input 0/4 to 20 mA or 0/2 to 10 VDC (user selectable), use for continuous density, pressure compensation etc.
Power supply	• 95 … 260 VAC, 50 … 60 Hz, 15 Watt • Optional: 24 VDC / VAC
Ambient temperature	• 0 to 50°C / 0 to 122°F

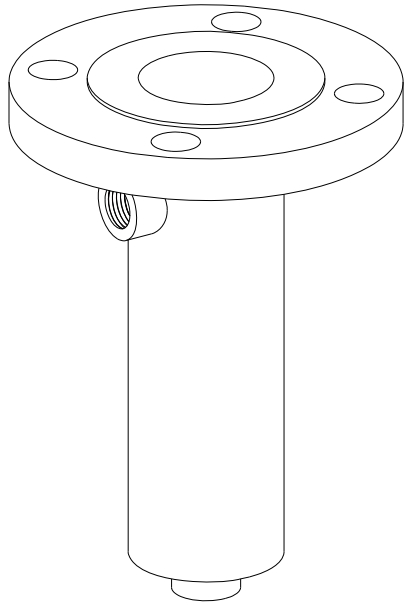
For complete specifications and model number selection request our VT-G130 specification sheet

Accessories

Accessories







Customer Customer	**Tag #** Tag		
Project Project	**Notes** Note		
Description Description			
Inquiry / PO # email inquiry			
Approval signature and date			

Viscotronics Co., Ltd.
info@viscotronics.com
www.viscotronics.com

MARIMEX Industries Corp.
info@marimex.com www.marimex.com

Dimension are in millimeters unless otherwise specified
Tolerances
No decimal: ± < 0.5 mm
One decimal: ± < 0.05 mm
Two decimals: ± < 0.005 mm

	Name	Date
Drawn	DMB	2011-08-12
Checked	DMB	
Revised	DMB	
MFR Appr.	DMB	

Manufacturing notes
Debur and break sharp edges

Notes
Cad genrated drawing, do not manually updale
The standard distribution format is pdf in A3 size, other formats may be available on request

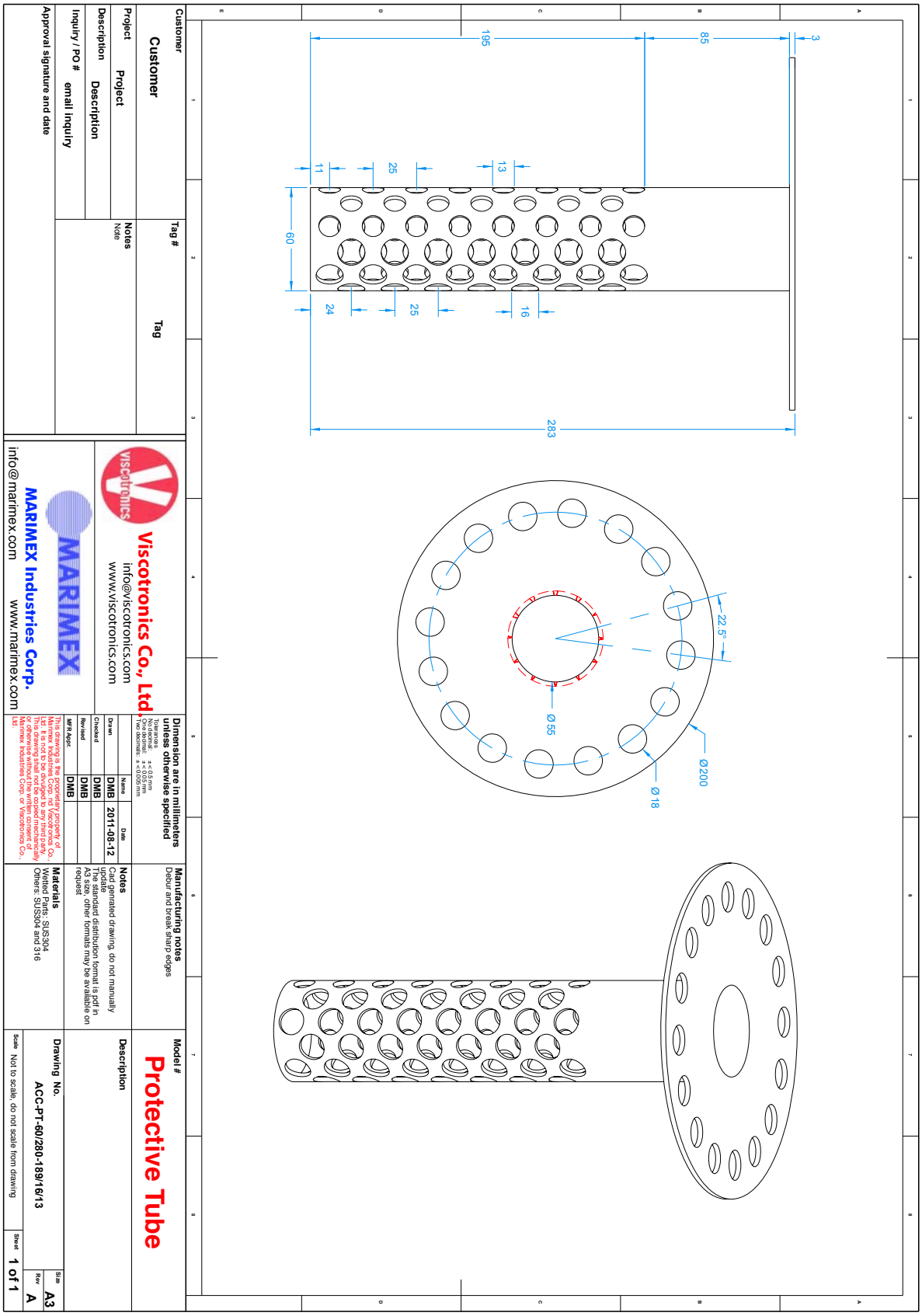
Materials
Wetted Parts: SUS304
Others: SUS304 and SUS316

Model #
2" Sample Cell

Description
Viscometer sensor for low viscosities
Viscositiy range maximum 1,000 mPa.s x gr/cm3
Process temperature maximum: 130 C / 340 F
Process pressure maxium: Per flange rating

Drawing No. ACC-2SC-A2/150RF-214
Size A3
Rev A
Scale Not to scale, do not scale from drawing
Sheet 1 of 1

Accessories



Customer: Customer
Project: Project
Description: Description
Inquiry / PO #: email inquiry
Approval signature and date
Tag #: Tag
Notes: Note

Viscotronics Co., Ltd.
info@viscotronics.com
www.viscotronics.com

MARIMEX Industries Corp.
info@marimex.com
www.marimex.com

Dimension are in millimeters unless otherwise specified
Tolerances
No decimal: ± <= 0.5mm
One decimals: ± <=0.05mm
Two decimals: ± <=0.005mm

	Name	Date
Drawn	DMB	2011-08-12
Checked	DMB	
Revised	DMB	
MFR Apprv	DMB	

Manufacturing notes: Debur and break sharp edges

Notes: Cad generated drawing, do not manually update
The standard distribution format is pdf in A3 size, other formats may be available on request

Materials: Wetted Parts: SUS-304
Others: SUS304 and 316

Model #: Protective Tube
Description:
Drawing No.: ACC-PT-60/280-189/16/13
Scale: Not to scale, do not scale from drawing
Size: A3
Rev: A
Sheet: 1 of 1

Viscotronics Co., Ltd.
171/109 Moo7, T. Chaichatan
A. Saraphi, Chiang Mai 50140
Thailand

Tel: +66-53-128410
Fax: +66-53-128409
email: info@viscotronics.com

Marimex Industries Corp.
#22-2475 Dobbin Road, Suite 227
West Kelowna, BC V4T 2E9
Canada

Tel: +1-201-467 5530
Fax: +1-888-844 1667
email: info@marimex.com

exclusively represented in Australia by:

Rheology Solutions Pty Ltd
15-19 Hillside Street
Bacchus Marsh Victoria 3340
AUSTRALIA

Phone: +61 3 5367 7477
Fax: +61 3 5367 6477
Email: info@rheologysolutions.com