cambridge visco pro 2000 manual

File Name: cambridge visco pro 2000 manual.pdf
Size: 2111 KB
Type: PDF, ePub, eBook
Category: Book
Uploaded: 26 May 2019, 21:34 PM
Rating: 4.6/5 from 550 votes.

Status: AVAILABLE

Last checked: 15 Minutes ago!

In order to read or download cambridge visco pro 2000 manual ebook, you need to create a FREE account.

Download Now!

eBook includes PDF, ePub and Kindle version

Book Descriptions:

We have made it easy for you to find a PDF Ebooks without any digging. And by having access to our ebooks online or by storing it on your computer, you have convenient answers with cambridge visco pro 2000 manual . To get started finding cambridge visco pro 2000 manual , you are right to find our website which has a comprehensive collection of manuals listed.
Our library is the biggest of these that have literally hundreds of thousands of different products represented.

Book Descriptions:

cambridge visco pro 2000 manual

Discover everything Scribd has to offer, including books and audiobooks from major publishers. Start Free Trial Cancel anytime. Report this Document Download Now save Save Visco Pro 2000 For Later 0 ratings 0% found this document useful 0 votes 103 views 63 pages Visco Pro 2000 Uploaded by Luz Stella Calixto Gomez Description visco pro Full description save Save Visco Pro 2000 For Later 0% 0% found this document useful, Mark this document as useful 0% 0% found this document not useful, Mark this document as not useful Embed Share Print Download Now Jump to Page You are on page 1 of 63 Search inside document Browse Books Site Directory Site Language English Change Language English Change Language. The VISCOpro 2000 offers automated fluid monitoring for continuous, reliable, accurate viscosity measurement. Powerful yet easy to use, the VISCOpro 2000 provides viscosity, temperature, temperaturecompensated viscosity, and optional density readings on an enhanced visual display panel. Thirteen factoryset standard measurement ranges from 0.220,000 cP are available for greater accuracy and process viscosity control. Over here you can explain why your offer is so great its worth filling out a form for. This page will Coil. Speed Range Computer controlled, variable 0, 202000 rpm. Viscosity Range 20. Mastersizer 3000 Mastersizer 3000E Mastersizer 2000. Zetasizer Ultra Zetasizer Pro. Setool2 manual r5a rus pdf no tone loss. WP user sign up to pro tools 10 keygen Android fanboys will still February How To Spray Paint Wheels Like a PRO. Manual. Also for Land cruiser fj80 series, Land. The Visco Lok can affect. With the sensor inserted into the pipe line, the magnetic piston is surrounded by the fluid sample deflected into the measurement chamber. Two coils inside the sensor body are used to magnetically force the piston back and forth a predetermined distance about 0.2 inches.http://alansh.com/pic/evinrude-tech-manuals.xml

- **cambridge visco pro 2000 manual, cambridge visco pro 2000 manual pdf, cambridge visco pro 2000 manual download, cambridge visco pro 2000 manual free, cambridge visco pro 2000 manual instructions.**

By alternatively powering the coils with a constant force, the piston s round trip travel time is measured. An increase in viscosity is sensed as a slowed piston travel time. The time required for the piston to complete a two way cycle is an accurate measure of viscosity. The deflecting fence acts to continuously deflect fresh sample into the measurement chamber. Since measurement of the piston motion is in two directions, variations due to gravity or flow forces are annulled. Also, because the piston has very little mass, magnetic forces greatly exceed any disturbances due to vibration. If the system is configured for a 5100cp measurement range the cycle time for 24cp is typically about 6 seconds. The measurement time of every viscometer independent of the measurement range is calibrated to be about 26 seconds at full scale 1.2 Calibration and Model Information The viscometer system has been factory calibrated and is ready for operation. After unpacking the system, make sure that all parts are accounted for before discarding the packaging. Review the certificate of calibration located in Appendix A at the back of this manual. This page will 1System Overview Rev A.doc 12 System Overview 4 indicate the sensor viscosity range and model information which should agree with your purchase order. 1.3 System Checkout To perform a system checkout, position the sensor in a nearly vertical position with the sensor opening facing upward process sensors only. 1. Connect the sensor to the electronics. Review chapter 5 to determine the operating sequence and if necessary, set the system to operating mode to monitor viscosity and temperature. Caution Use proper care when working with AC line power. Never connect or disconnect the sensor when the power is applied. 8. After the system has operated a few minutes, the indicated viscosity and

temperature of the sample fluid should correspond approximately to those shown on the fluid viscosity chart.http://www.gen-bags.com/admin/userfiles/canon-dr-7580-scanner-service-manual.xml

Operation of the sensor in free air may cause drift and other temperature effects which will prevent realization of the full specified accuracy. If accuracy verification is necessary, contact your sales representative for detailed instructions. 9. When you have familiarized yourself with the operation of the viscometer, disconnect the power, remove the piston, and clean both piston and sensor with an alcohol based solvent or a standard degreaser. Reinsert the piston and secure the flow deflector if present before use. 1.4 Maximum Ratings and Approvals Refer to the markings on the sensor ID tag for maximum sensor ratings and approvals. To ensure compliance with the approvals marked, always install and maintain the sensor in accordance with factory recommendations. Installations should be performed in accordance with local codes. 1.5 Warranty Information All products are guaranteed against defective parts and workmanship. The SPC501 sensor has a locking pushpull connector on its base. There is a standard Viton Oring at the base of the sensor. A small amount of fluid circulates around the sensor to ensure good thermal equilibration. During operation, the top of the piston extends about 0.05 inch beyond the face of the sensor ensuring good mixing of fluid into the measurement chamber. Both sensors can be optionally mounted in a small diameter pipeline using standard tees see figure 2.2. All sensors should be oriented with measurement chamber upward, preferably by about 45 degrees, cable end low so that air will be easily vented. Cyclic operation of the piston has a selfcleaning effect. The best way to use a sensor is to keep it wet. Care should be taken to avoid hardening of process fluids inside sensors. Pull with your index finger, so the side of the cap farthest from you will come out first. 2. Remove the piston. Compressed air can be blown into or across the measurement chamber, which causes the piston to jump out of the chamber.

Warning When blasting the chamber with air, hold a paper towel over the chamber to shield your eyes from the spray. 3. Fill the chamber with the fluid to be measured. A clean toothpick may be used to force the fluid into the measurement chamber. If the piston is stuck in the withdrawn position, soak it with an appropriate solvent then dislodge it with brief bursts of clean compressed air directed at the side of the measurement chamber. Use protective eyewear and direct the sensor body away from your face during this process. 2.3 Installation Tips Minimizing Flow affects The flow deflector is designed to limit disturbances sensed by the piston and maximize the introduction of new fluid samples. If the flow rate is too high for this orientation however, it usually results in unstable viscosity indications. Reducing the pump speed or turbulence in the system should reduce this instability. When using a jacket with the SPL571 sensor measurements should only be made after the flow has stopped. At this orientation the measurement chamber can most easily eliminate ingested air Series Rev C.DOC 23 Sensor Installation 8 Filtering Out Particles Filtering the fluid, if practical, will eliminate any potential problems with particles. The presence of certain particles can results in erratic viscosity readings and buildup within the measurement chamber. Particle size tolerance is range dependent. The following chart can be used as a guide. For more detailed information, consult the factory. As the sensor cable carries a precisely calibrated current to the coils imbedded in the sensor, any changes in the wire resistance adding connectors or changing length will alter the current received by the sensor coils. Extension cable limits depend on the gauge of the extension cable, operating temperature of the cable and sensor, and calibrated drive current sent to the coils. For detailed information, consult the factory.

Thermal Gradients at High Temperatures To get accurate and stable measurements of both viscosity and temperature at elevated temperatures, it is important that the tip of the sensor be inserted well into the vessel or jacket. Depending on your setup, insulating the sensor, piping or jacket enhances accuracy. When installing or removing the Model SPL501 or SPL571 sensor, do not excessively twist or kink the cable. Disconnect the cable before threading the sensor in or out to prevent damage. The

connectors used on SPC501 sensors utilize a pushpull locking mechanism do not attempt to twist the connector to remove it from the sensor. It is important to protect the connectors from getting wet. The connectors are not sealed and are vulnerable to corrosion and shorting from many process fluids. The nine sensor wires are connected to back of the enclosure with a locking connector. Similarly, outputs if available are accessible from the back of the enclosure. A locking positioner swings down from the bottom of the cabinet to enhance bench top viewing. If the power cord becomes damaged or if it is not compatible with the power outlets to be used, it should be replaced with a locally obtained power cord which has an IEC receptacle. The power inlet module also houses the power switch and the protective fuse. The fuse is a 5 x 20 mm, 1 A slow blow. To access the fuse, unplug the power cord and pry out the fuse carrier adjacent to the IEC connector. The sensor plug inserts into the mating receptacle on the upper rear panel of the enclosure. There are 420 ma electrical outputs for viscosity, temperature, and temperature compensated viscosity, and a 5 VDC TTL output for alarm. The alarm output is TTL compatible and can supply at least 25 ma to energize a solid state relay. Continuous control, as the name implies, takes on any value from 4 to 20 ma.

It is intended to be used to operate a proportional valve, either directly or through a converter, to heat process fluid or add solvent. It is located in the lower center of the rear panel of the enclosure See figure 4.1. Time proportional control or the alarm output is available at this port depending on the value of the Alarm Output Port variable, AOP. Time proportional control is in the ON state for a varying percentage of time. The alarm output is either ON or OFF depending on the current alarm condition. Each of the available configurations is discussed below in detail. Refer to the model number on either the Certificate of Calibration in Appendix A or on the viscometer itself to find out which configuration is applicable. The SSR used is rated at 3 Amps, VAC, Hertz. In either case the electrical load should not exceed 30 watts. When an alarm condition is present, the relay contacts will be closed ON. When there is no alarm condition the relay will be open OFF. Refer to chapter 5 for the alarm point setup. The Mechanical Relay Output configuration is typically used to switch a source of power into a load such as a buzzer or lamp. Wiring interconnect should be made as shown in the figure below, figure P Alarm Output Load Power Source Fig 45 Relay Output Connection 4Benchtop Connections Rev A.doc 44 Connecting the Electronics 15 4.6 Serial Port RS232 Serial Port Wiring In order to utilize the RS232 serial port, off the shelf serial port cables and adaptors may be obtained locally. If permanent wiring is preferred, it may be desirable to hard wire a connection from a computer to the serial port connector. Preferably the cable would consist of a shielded pair with runner. The optional printer can be connected through the serial port using a DB9 null mode cable with a male to male gender changer at the printer end. Note Electrical connections should be made in compliance to local codes. 4Benchtop Connections Rev A.

doc 45 Connecting the Electronics 16 5 Viscometer Operation The viscometer is made up of a sensor and the operating electronics. The following sections will cover the basic operation of each. 5.1 Sensor Overview Flow Deflector Fence Coil A Piston Coil B RTD Fig. 51 Cutaway View of Sensor Tip Installed in a Pipe Line The Cambridge Applied Systems pistonstyle viscometer contains two magnetic coils inside a stainless steel body. A low mass stainless steel piston inside the measurement chamber is magnetically forced back and forth in the fluid. The time required for the piston to move a fixed distance about 0.2 inches is then very accurately related to the viscosity of the fluid in the chamber. As the piston is pulled toward the bottom of the measurement chamber, it forces the fluid at the bottom of the chamber to flow around the piston toward the sensor opening where it interchanges with the normal flow of the fluid. On the upward piston stroke, fresh process fluid is pulled around the piston to the bottom of the measurement chamber. The flow deflector continuously diverts fluid from the process stream into the outer portion of the measurement chamber, thereby refreshing the measured fluid. Since measurement of the motion is made in two directions, variations in travel time due to vibration, orientation, and flow are almost completely eliminated. Temperature is measured continuously with the use of a platinum Resistance

Temperature Detector RTD mounted at the base of the measurement chamber. Since the viscosity of a fluid varies significantly with temperature, it is important to know the exact temperature of the measurement chamber. 5VP2K1.08 Rev D.doc 51 Viscometer Operation 17 5.2 Basic Electronics Operation Software in the ViscoPro electronics controls a four line display that allows the user to operate the viscometer by means of a userfriendly menu.

The main menu enables election of the operate mode, selection of the product setup, changing the set point, optional, review of the setup, and selection of the supervisory menu. When you receive the system, it will be calibrated and ready for operation. There are additional settings which may need adjustment on rare occasions through the use of the supervisory menu which is accessed by entering an access code. These restricted features include setting of Viscosity and Temperature units, adjustment of the fluid properties, setting process control parameters, adjustment of alarm points, setting the number of points to be used in the rolling data average, adjustment of the date and time clock, initiation of sensor purge, choice of the interval between successive logged data points, choice of control variable, and changing the supervisory access password. There are also a number of set and forget parameters which may be changed from their factory set values if necessary by means of a computer terminal connected to either the RS232 or RS485 serial ports of the ViscoPro. Selection of menu items is controlled by four multifunction membrane switches on the face of the ViscoPro. The UP and DOWN buttons are used to move vertically through the menu selections. The menu selection is indicated with a triangle on the left edge of the display. If an underline cursor is displayed under a number, the UP and DOWN buttons increase or decrease the underlined digit. If the field is alphanumeric, the digit will cycle through the alphabet as well as the 10 numerals. Holding the UP or DOWN key will result in a rapid progression of values. The sign can also be changed with the UP and DOWN keys. The ENTER button is used to either 1 ENTER select a chosen entry, which will move you on to the next set of choices, or 2, if an underline cursor is displayed, move the cursor horizontally to the right.

The ESCAPE button is used to either 1 exit the chosen entry, which will move you to the previous set of choices, or 2, if an underline cursor is displayed, move the cursor to the left. 5VP2K1.08 Rev D.doc 52 Viscometer Operation 18 When the ViscoPro is first turned on, it will go through a powerup initialization and then perform a number of diagnostic checks. During this time, an introductory screen appears. The next screen that appears is the main menu. Pushing the ENTER button will select the indicated functions. Operate Choose Setup Review Setup Supervisory Menu ESCAPE ENTER Operate Fig. 52 Main Menu on Touch Panel Display The normal state for the ViscoPro is to be measuring the viscosity and temperature of the process fluid and possibly controlling the characteristics of the fluid while displaying the measurement and control data. This state is achieved by selecting the Operate entry on the main menu. A submenu appears which offers a choice of 1 Monitoring Only, with no control function, 2 Monitor and Control, and 3 Sensor Standby. Upon entry to this screen, the selection arrow will point to the current operating mode. The bottom line will indicate the active setup. Viscosity and TCV will be reported using units of centipoise cp, centistokes cst, cup seconds sec, or Saybolt seconds SSU depending on the way the system is configured. Similarly the temperature will use either the Celsius C or the Fahrenheit F scale, depending on the system configuration. This situation will occur on startup and if the viscosity is grossly out of range, either due to viscosity too low or too high. Similarly, if the sensor is unable to measure the temperature RTD broken, the temperature will be set to 40. In either case the value of TCV will be set to 0. If there is an active alarm state, the fourth line of the display annotates the alarm. Additionally if there is a sensor timeout or an open RTD circuit, there will also be a corresponding annotation on the fourth line.

This is achieved by cyclically displaying the setup designation and any active alarm message. If Monitor and Control is selected, the sensor begins measuring viscosity if it was not already doing so.

The system positions the proportional band based on the value of Expected Control Output for the active Setup see the next subsection and begins PI control if it was not already doing so. The data display will be the same as in Monitor Only. It will appear on the line corresponding to the variable being controlled. If Sensor Standby is selected, the sensor will cease viscosity measurement although temperature measurement will always continue. If the system had been controlling viscosity or TCV, this control will cease. If the system had been controlling temperature, it will continue to do so even when the viscosity sensor stops. To defeat temperature control as well as shutting down the sensor, first select Monitor Only and then Standby Choosing a Setup The primary userspecified variable in the software is what is termed the Setup. Each Setup specifies more than a dozen parameters and variables as a group. When Choose Setup is selected from the Main Menu, a submenu of currently available Setups is displayed. The selection triangle will point to the active Setup. By moving the triangle up or down with the UP and DOWN buttons and then pressing ENTER, a new Setup may be selected. When a different measurement range or sensor is implicitly selected by changing the Setup, the system automatically recalls the stored calibration values for that range or sensor. No new calibration is necessary. Be sure to make the corresponding changes to the system. Warning Never connect or disconnect the sensor while the system is ON. 5VP2K1.08 Rev D.

doc 54 Viscometer Operation 20 Changing the Control Set Point Optional When enabled, this menu feature allows the operator to directly change the control setpoint without accessing the supervisory menu Reviewing a Setup Key parameters for the currently active Setup may be reviewed by selecting Review Setup from the Main Menu. This choice presents a series of informational screens which allows the user to review several Setup parameters and variables to verify that they are correct. These may be modified through the Supervisory Menu if that is desired Supervisory Menu The Supervisory Menu can only be accessed by entering the correct four digit access code. If no key stoke activity has been made for approximately one minute, the system will automatically revert to the Main Menu. Most of the variables which can be changed through the Supervisory Menu are Setup properties, that is, they may have a different value for each setup. The Supervisory Menu screens allow changing the properties of the currently selected Setup. If a different Setup is selected, the settings that were stored for that Setup will be recalled for use from memory. At that time the Supervisory Menu will allow modification of those values. Before entering the Supervisory Menu, note which Setup is active Units of Measure The Units of Measure menu can be accessed through the Supervisory screen. This menu has two submenus, Viscosity Units and Temperature Units. The temperature menu allows the user to display units in either Celsius or Fahrenheit. The viscosity menu allows the user to display in units of cp, cst, SSU, or Cup Seconds. Cambridge Applied Systems viscosity sensors measure absolute viscosity, which is the true measure of viscosity the resistance of a fluid to flow. The practical unit of absolute viscosity is centipoise cp, which is identical to the MKS unit mpa s. The viscosity of water is approximately 1 cp.

Cup type viscometers are commonly used in industry but they respond not only to absolute viscosity but also to the fluid density. The gravitational forces acting on the fluid within the cup will be proportional to the density of the fluid. Thus a fluid with the same absolute viscosity but higher density will drain out faster and therefore appear to have a lower viscosity. Viscometers such as the cup type measure kinematic viscosity, whose practical unit is cst. The Viscopro conversion to Saybolt Universal Seconds SSU is done according to ASTM standard D2161. This estimate is based on the assumption of a linear relationship between temperature and the double logarithm of viscosity. Once set, TCV produces a very accurate estimate for any liquid hydrocarbon and yields a reliable approximation for most other fluids. The first screens under Fluid Properties allow the two TCV parameters to be adjusted. 5VP2K1.08 Rev D.doc 56 Viscometer Operation 22 The first display screen under Fluid Properties indicates the current reference temperature setting. This is the temperature at which the value of viscosity is being estimated. For maximum accuracy, it is

recommended that this be set within a degree or two of the standard process temperature. The current Setup designation is also displayed on this screen as a reminder. The second screen allows setting Temperature Compensation Coefficient TCC of the process fluid. For every process fluid the relationship between viscosity and temperature will be somewhat different and this relationship is described using the coefficient TCC. To calculate TCC for the active Setup, the viscosity of the process fluid should be known at two temperatures. For maximum accuracy, it is recommended that these two temperatures be chosen perhaps 5 to 10 C apart so that they bracket the standard operating temperature. Note that this formula will yield the same result if Briggs base 10 logarithms are used in place of Napier base e logarithms.

Also absolute temperature may be expressed in the Rankine scale, which is achieved by adding to the temperature in Fahrenheit. This value is used when displaying viscosity in units of centistokes cst, cup seconds, and SSU. The ViscoPro necessarily measures absolute viscosity but can display viscosity in units of cst, cup seconds, or SSU if desired. The ViscoPro uses the value of density to convert measurements requiring density values. Density is used to compute viscosity in units of cst, cups, and SSU. If units of cp are used, the value of density is irrelevant and need not be changed. Again, all the parameters set in the Control Parameters screens are specific to the currently selected Setup. A more thorough discussion of control is presented in section 6. This section will give only a cursory description of the variables. If the control variable is set to viscosity or TCV, values for the Setpoint can range from 1% to 200% of Full Scale, although 5 to 100% Full Scale is the recommended range. The control set point screen can be accessed from the main menu if the serial port variable ESP is enabled see section 6.3. The second screen is used to set the Proportional Band. Again, the first line of the display indicates the control variable. The Proportional Band is entered in units of viscosity or temperature as appropriate. Viscosity Proportional Bands may be set to values which are between 0.1% and 1,000% of Full Scale. Temperature Proportional Bands can be set from 0.1 to 10 deg C 0.2 to 18 deg F. The third screen sets the System Stabilization Time, which is your estimate of the time in minutes necessary for the physical system to reach a new stable point after a change in the steadystate solvent flow or heat rate. System Stabilization Times can be set from 6 to 240 minutes. The fourth screen is used to enter the Expected Control Output which is used to preposition the proportional band when control commences.

This parameter is an estimate of the control output, expressed as a percentage, needed to maintain the desired value of the controlled variable Alarm Point Setup The ViscoPro 2000 has optional visual and electrical alarms that can be triggered by crossing either a high or low threshold of viscosity, temperature, or temperaturecompensated viscosity TCV. The Alarm Points screens are used to set these six thresholds to the desired values. A triggered alarm point is visually indicated by the flashing of the display backlight and an annotation of the problem on the fourth line of the Operate Display. The electrical indication of a triggered alarm point is marked by a transition of the ALARM output to a TTL logic level 5VP2K1.08 Rev D.doc 58 Viscometer Operation 24 HIGH that is sustained for the duration of the alarm condition. For information on logically inverting the alarm output consult your Cambridge Applied Systems sales associate. The default value for the AOP variable is zero. The alarm points are Setup variables. The values displayed when each screen is entered are those for the active Setup. Changes to the alarm points apply only to the active Setup. If you change Setups, the alarms will adjust to the stored settings for that Setup. If units of cst, SSU, or Cups have been selected, the viscosity and TCV alarm points will be expressed in the appropriate unit of measure. If Fahrenheit has been selected, the temperature alarm points will use this unit of measure. See section 6 for details on changing the units of measure. All six alarm points are enabled whenever process information is available. When shipped from the factory, the alarm thresholds are set well beyond the normal operating range so the alarm thresholds will never be exceeded.

Since alarms are always active, undesired alarms may be defeated by setting the corresponding

alarm thresholds to values which cannot physically be achieved Data Averaging ViscoPro software computes the viscosity, temperature and temperaturecompensated viscosity at the end of each piston stroke, based on the last two strokes, i.e., the previous piston cycle. The software may be configured to compute the rolling average of any integer number of cycles from 1 to 20. As a result, all data presented on the Operate data display screen, electrically output on the 420 ma current loops, and logged for later retrieval will reflect a value that is the rolling average over the number of cycles selected. The rolling average discards the oldest data each stroke and adds the newest data point. Data averaging has the advantage of smoothing the data and thereby reducing scatter; however, it increases the response time. If your process varies very slowly, it will be advantageous to use data averaging. If you are interested in the fastest response time, as in reaction tracking, data averaging should be avoided. Note that the PI control feature in the ViscoPro software uses nonaveraged values of temperature, viscosity, or TCV upon which to base control, whether or not data averaging is selected. It may be necessary to set the clock to your local time, change to or from Daylight Time, or to occasionally correct the clock for drift. If the time and date values are correct, press ESCAPE to return to the Supervisory Menu. Otherwise press ENTER. Once the Time and Date display screen is ENTERed, there will be a progression of five screens to allow setting the clock. After ENTERing all the date and time settings, the initial Time and Date display screen will appear again.