

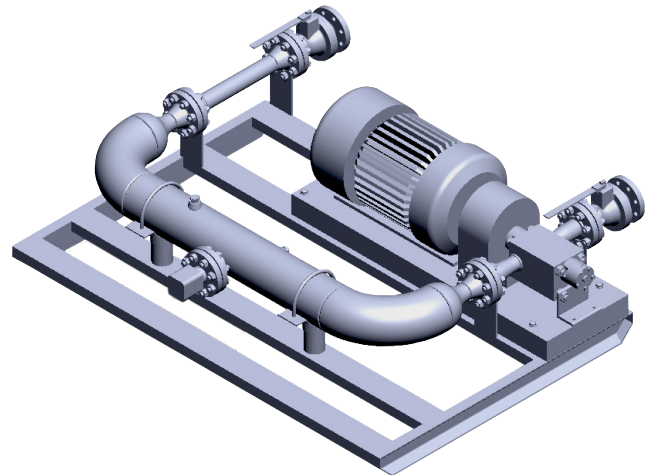
Viscosity Sensing Unit

Bulletin SS02020 Issue/Rev. 0.0 (10/11)

The **Smith Meter® Viscosity Sensing Unit (VSU)** is a compact skid solution to effective and reliable installation of an on-line viscometer. The VSU is intended to be installed to provide accurate viscosity measurements to the Smith Meter Universal Performance Curve Compensator (UPCC) for viscosity compensation of helical turbine meters on multiple product installations.

Features

- **Accurate measurement of viscosity** via control of fluid velocity through viscometer chamber.
- **Wide viscosity range** – to over 1,000 cSt.
- **Special flow-through chamber** – eliminates viscous shear forces for highly accurate measurement of viscous crude oils.
- **Positive displacement pump with variable frequency drive** – for precisely controlled flow through the flow-through chamber to ensure the highest accuracy in viscosity measurement.
- **Inlet and outlet block valves** for ease of installation and maintenance.
- **Turnkey viscosity solution for multi-product lines.**



System Overview

The VSU System consists of the TechnipFMC – supplied skid that includes the Solartron 7827 viscometer head, along with a Solartron 7950 Signal conditioner (that must be mounted remotely in a control room environment). The system also includes the VSU Interface Software installation package. A Windows PC (end user provided) with the VSU software installed is required to interface with the VSU system to the MVTMs and UPCCs in the field.

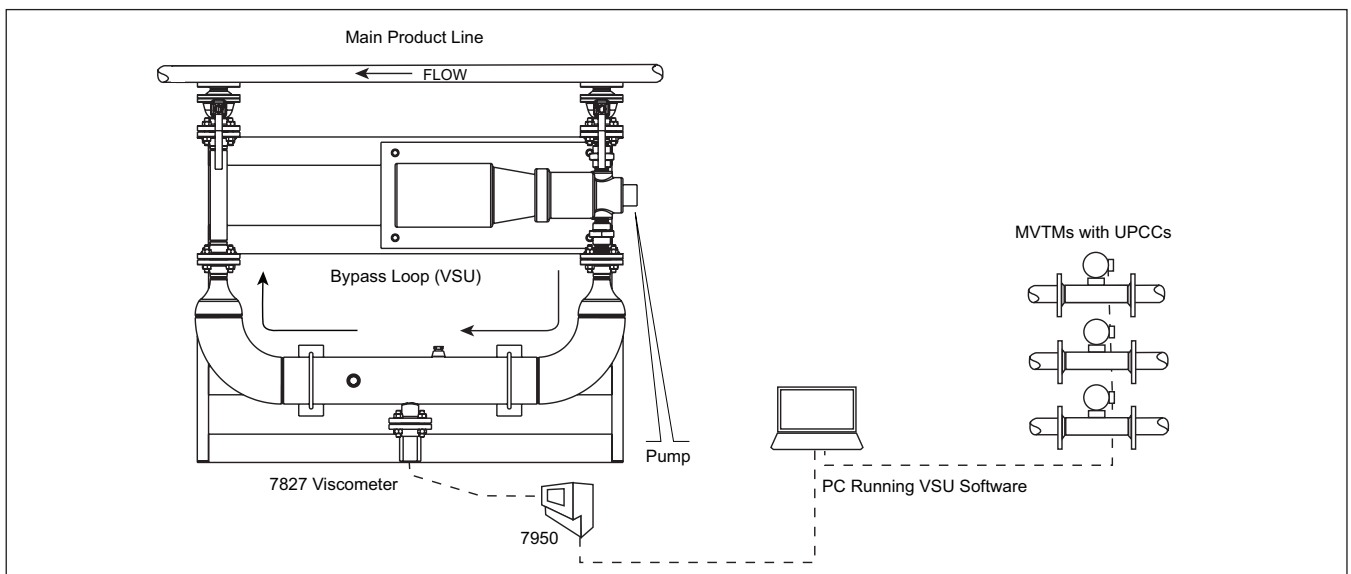
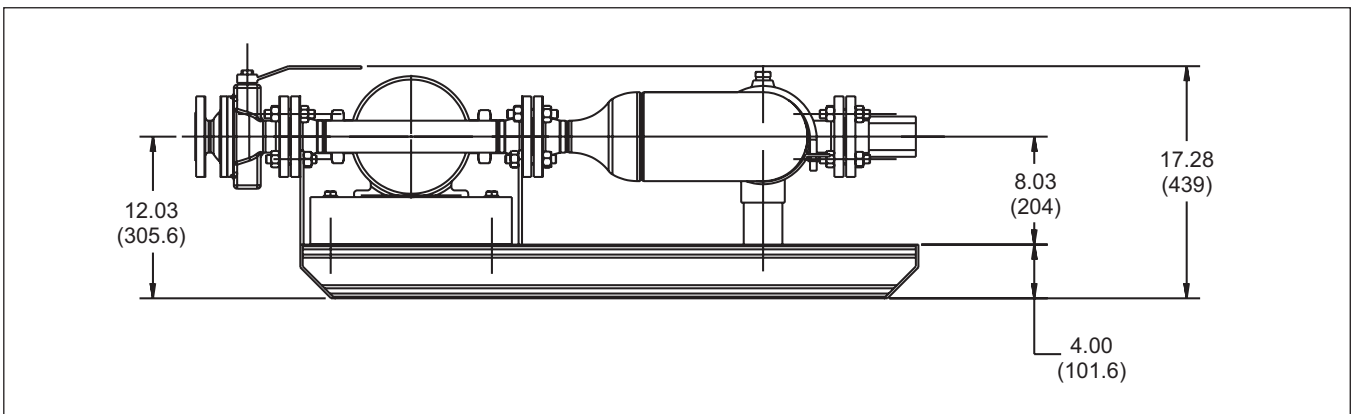
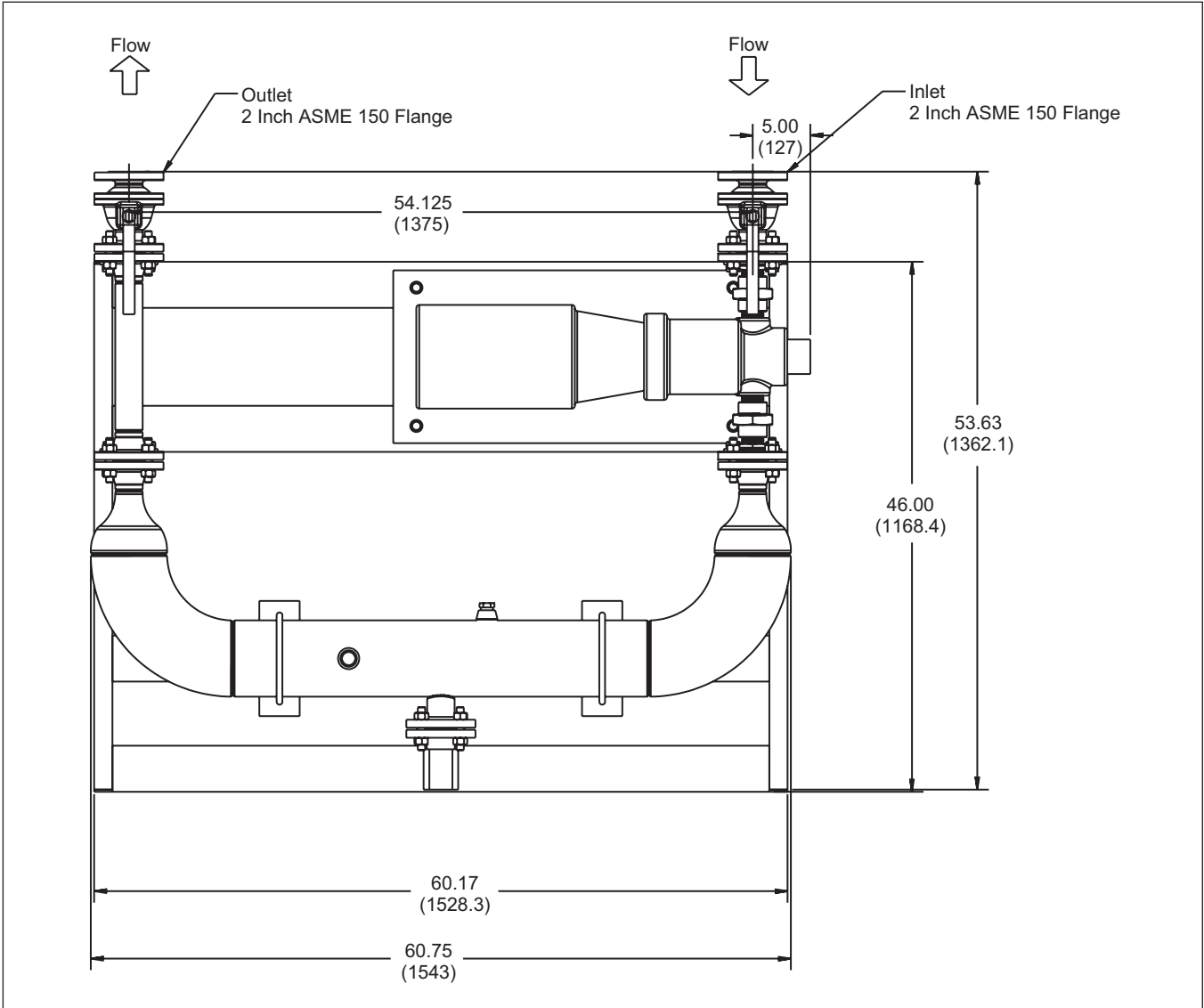


Figure 1 – VSU System Overview

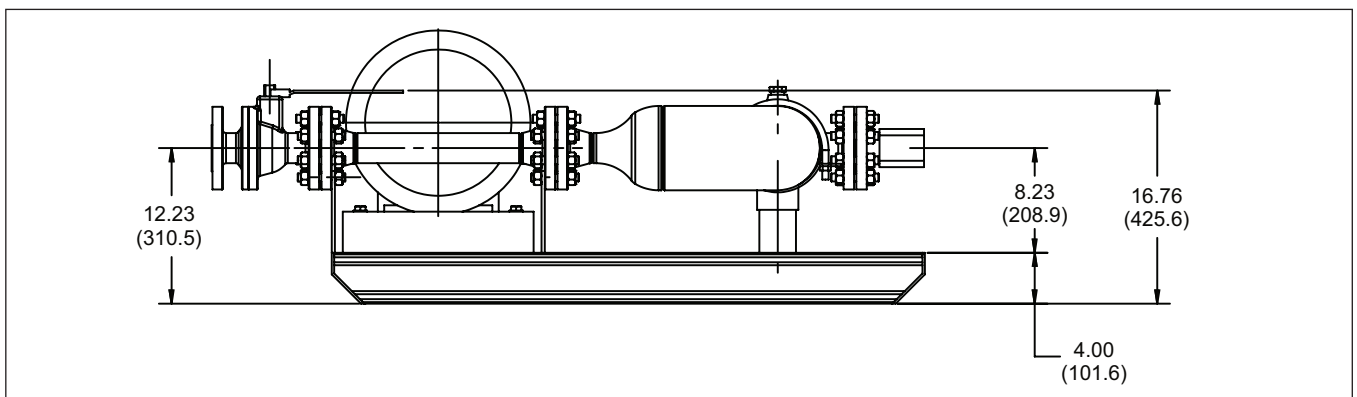
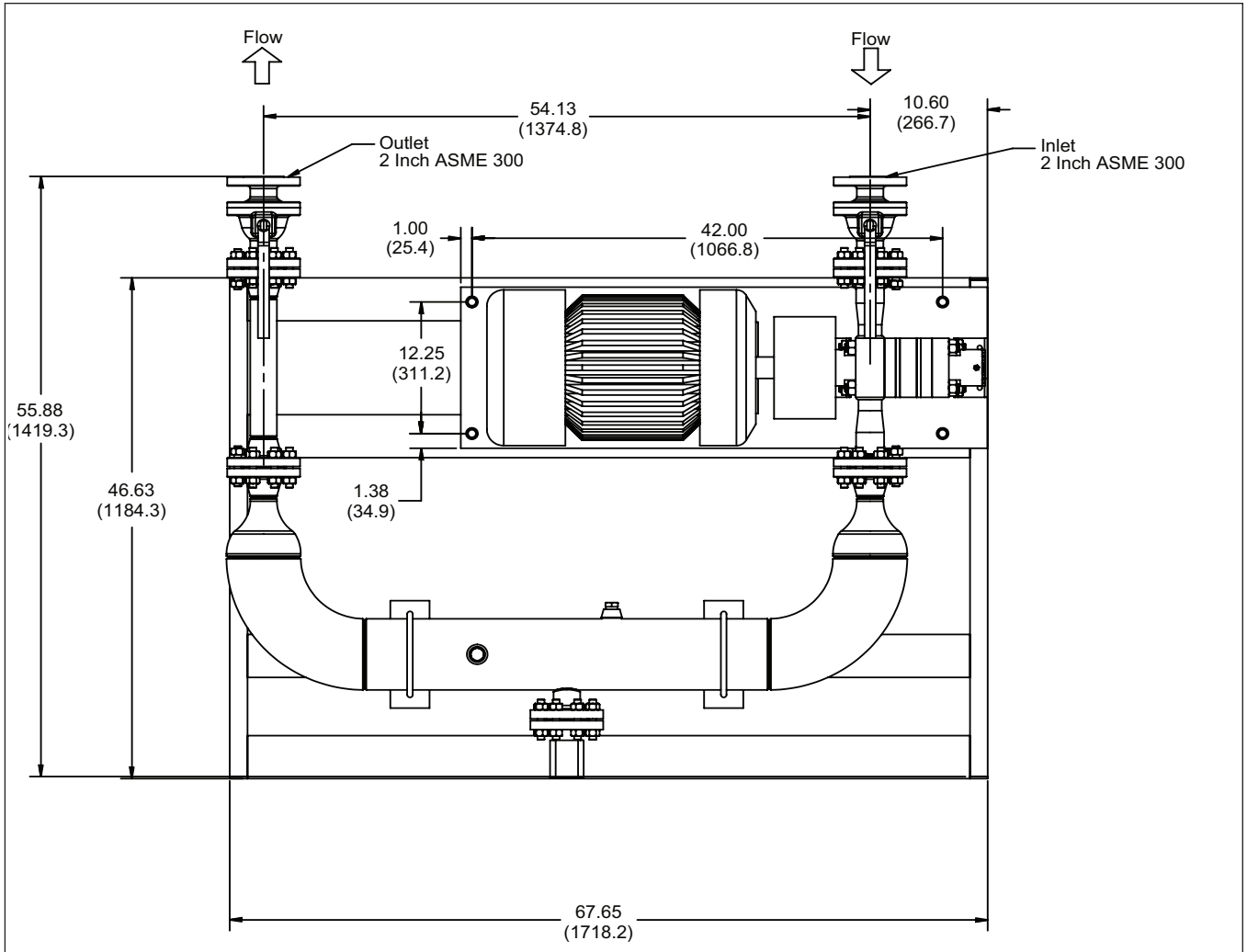
Dimensions (ASME 150)

Inches (mm)



Dimensions (ASME 300)

Inches (mm)



Installation

- Installation to be on the main header so viscosity measurement is applicable to all meters in the metering system.
- System shall be installed level and on a solid base foundation.
- Inlet and outlet connections are 2" ASME flange.
- System vent shall be plumbed to a safe area.
- System drain shall be plumbed to a safe area.

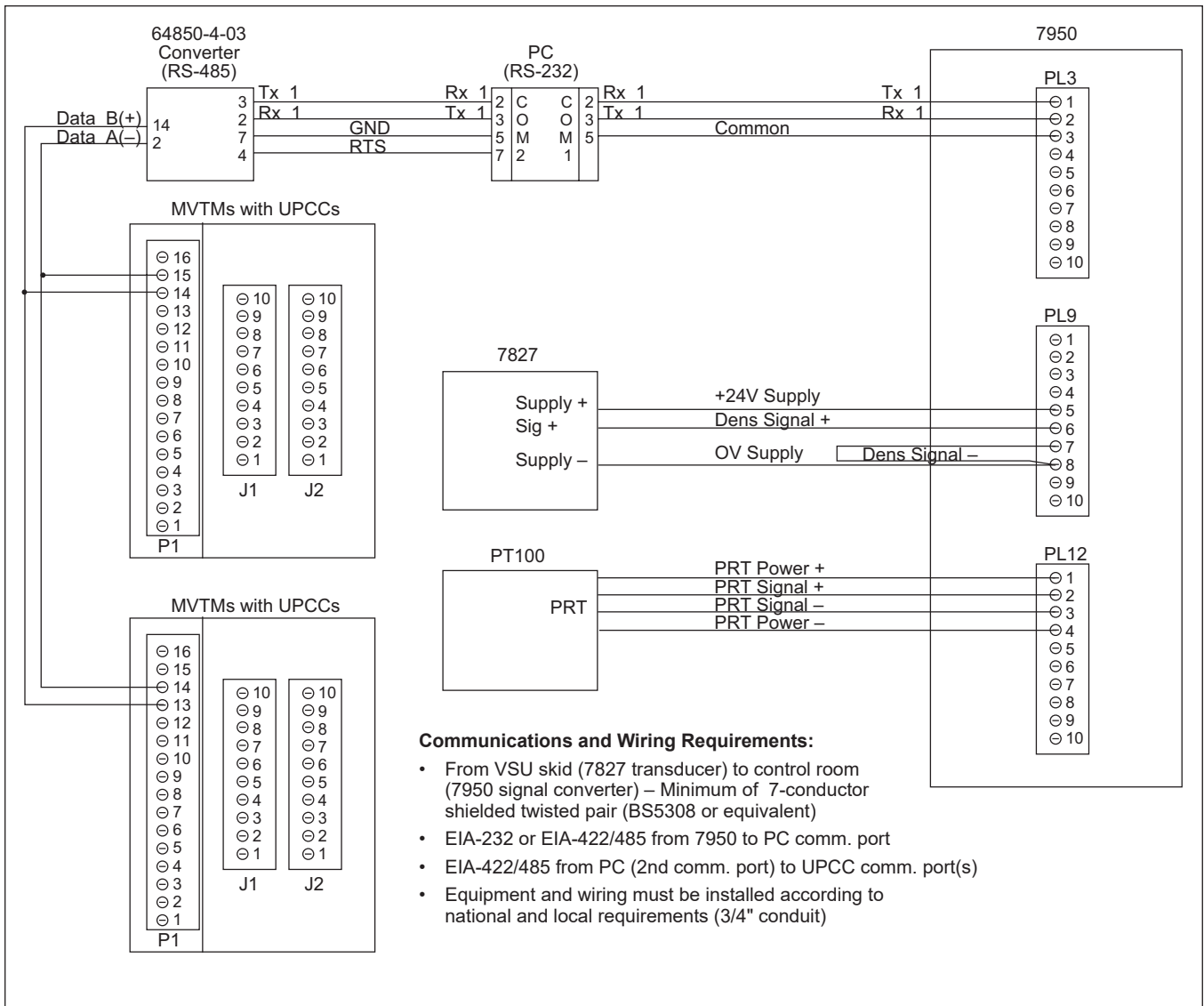


Figure 2 – Model 7950 Wall-Mount Signal Converter wiring diagram

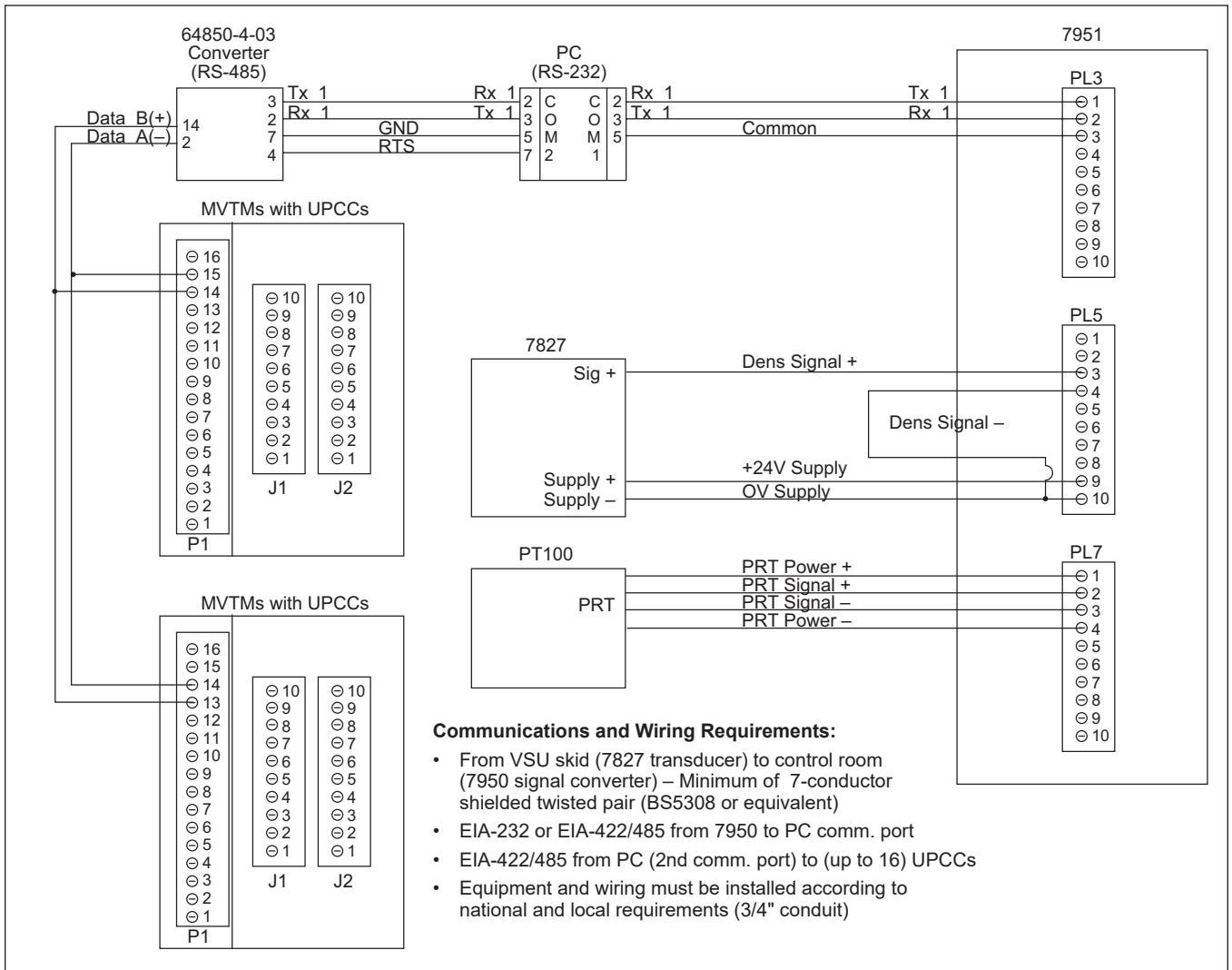


Figure 3 – Model 7951 Panel Mount Signal Converter wiring diagram

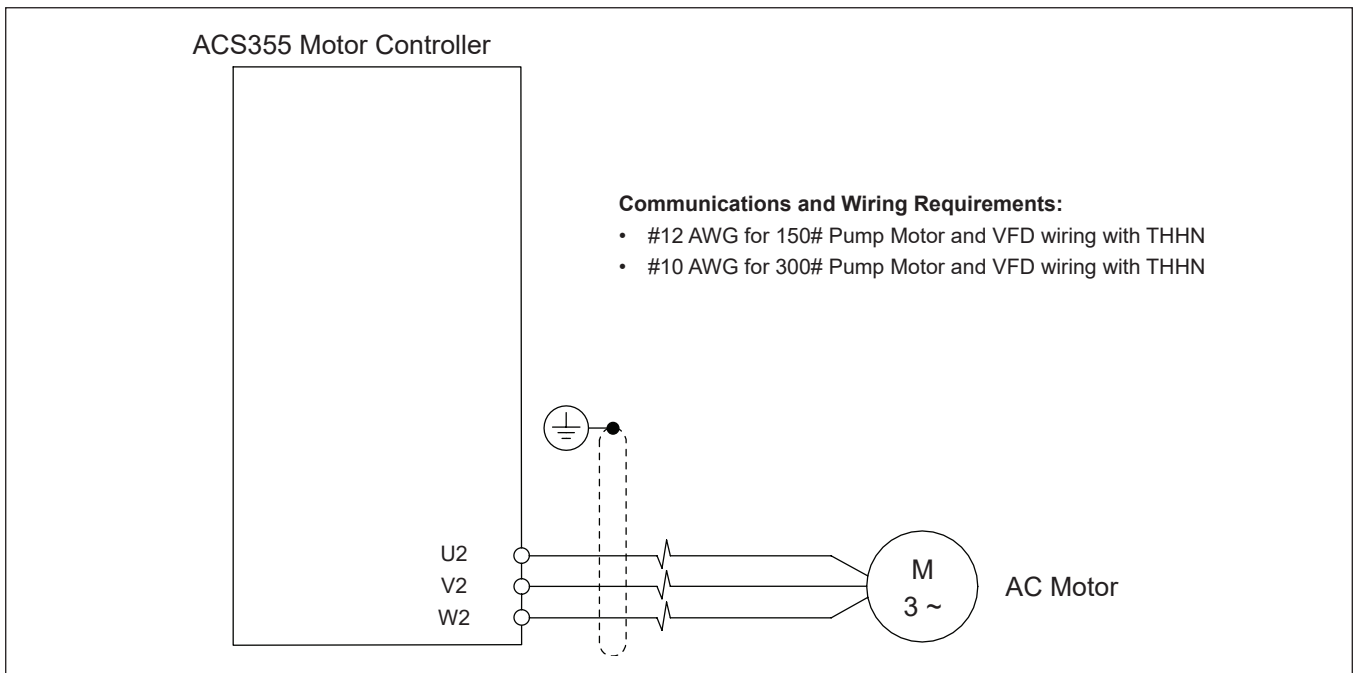
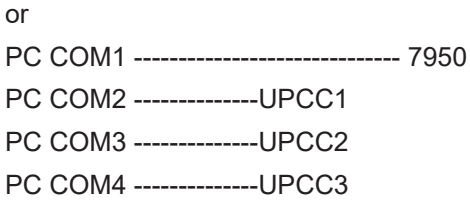
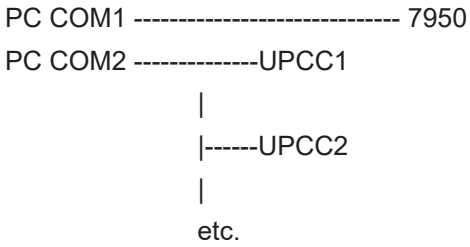


Figure 4 – Model ACS355 Motor Controller wiring diagram

Site Considerations

Recommended Configuration: It is recommended that the PC have multiple serial ports installed, and that the port configured for the 7950 communications link is dedicated to that purpose. It is possible that one or more UPCCs can share the 7950's serial link but performance may be adversely affected, and a failure of any one device will be detrimental to the system. Daisy-chaining the serial communication link for the UPCCs is typical. One port per device is also a possible solution.



Start-Up

- Slowly open upstream connection block valve until fluid begins to enter the VSU system.
- Open the vent and allow all air to vent from the system.
- Close the vent and fully open the upstream valve.
- Fully open the downstream valve.
- Energize the motor and pump using the motor controller.

VSU System Software

The VSU Main Window is a dialog style interface that displays the current viscosity data and allows the user to configure the port, settings, and address of the viscometer signal converter, as well as configure the list of UPCCs that are periodically updated with the viscosity information.

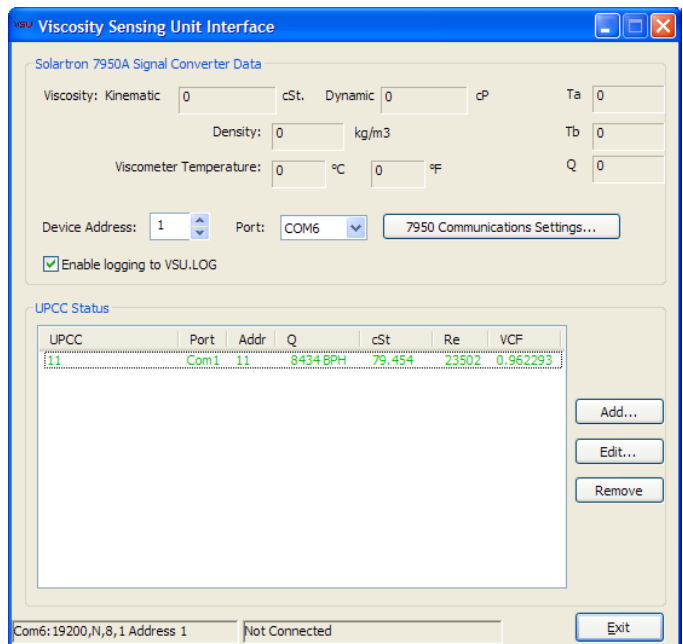


Figure 5 – VSU System Software Main Window

To begin using the software, simply select the correct communications port and address for the 7950, configure the port settings and wire the serial line appropriately to begin collecting data from the signal converter.

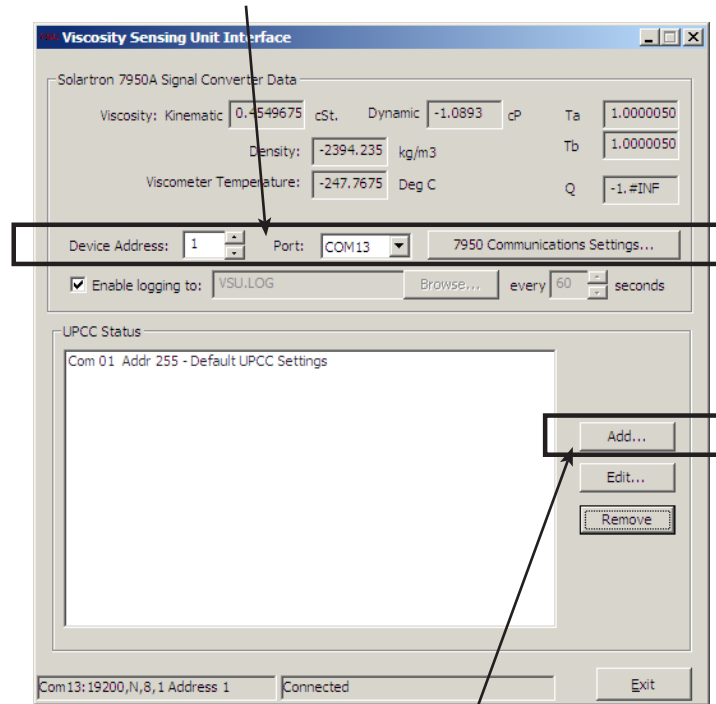


Figure 6 – VSU System Software Port Configuration

To configure UPCC devices to receive the viscosity data, click the **Add...** button next to the UPCC Status list. A popup dialog allowing you to configure the UPCC to add will appear.

All settings are automatically stored, so if you shut down and restart the application it will remain as previously configured.

The UPCC Configuration Dialog

Clicking the Add.. or Edit... buttons on the VSU will bring up the UPCC Configuration Dialog, allowing the setting of required information specific to an individual UPCC in the system.

Select the communications port to which the UPCC will be connected, and specify the device address as configured in the UPCC. The VSU supports only Modbus RTU mode so the UPCC communications ports must be configured accordingly. (Note: it is recommended to use UPCCMate or another Modbus tool to configure each UPCC included in the system prior to using the VSU. Each UPCC should be programmed with a unique address).

The Description field allows the entry of a name to make the device readily identifiable in the list.

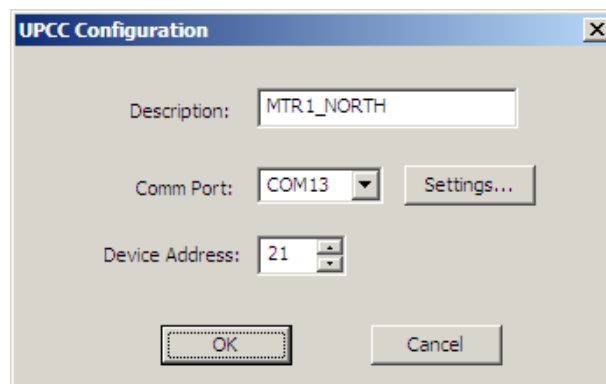


Figure 7 – VSU System Software UPCC Configuration Dialog

Related Publications

The following literature can be obtained from FMC Technologies Measurement Solutions, Inc. Literature Fulfillment at measurement.fulfillment@technipfmc.com or online at http://info.smithmeter.com/literature/online_index.html. When requesting literature from Literature Fulfillment, please reference the appropriate bulletin number and title.

UPCC and MVTM

Installation and Operation Manual (UPCC)	Bulletin MN02011
Specifications (MVTM)	Bulletin SS02016
Specifications (UPCC).....	Bulletin SS02017
Technical Paper	Bulletin TP02007

March 2019 - Updated branding and contact information.

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.