

SIEMENS

SUGGESTED SPECIFICATION SITRANS FUP1010

Portable Multifunction Clamp-On Single Channel Transit-Time Flowmeter

The furnished flowmeter shall be of a portable clamp-on design precluding the requirement of penetrating into the pipe. In addition, the flowmeter shall be microprocessor based utilizing the transit-time flow measurement technique. The flowmeter shall employ the phase detection multiple pulse transmit principle in conjunction with multiple frequency axial beam transducer technology to insure operation on liquids with solids and or bubbles. In addition, the flowmeter shall incorporate an alternate Doppler method measurement mode for highly aerated or heavy solid bearing liquids.

The flowmeter shall provide automatic transducer spacing, Reynolds Number and liquid sonic velocity variation compensation and live zero flow measurement. The flowmeter shall have the ability to indicate flowrate, flow velocity, total flow, signal strength, liquid sonic velocity, liquid aeration and Reynolds Number. The flowmeter shall be equipped with an integral front panel keypad and multifunction 240 X 128 pixel LCD display. The flowmeter shall have internal memory of 1 MB for datalogging purposes. In addition, the flowmeter shall provide self and application diagnostics to isolate any fault conditions to either equipment failure or abnormal process conditions. Diagnostics shall also be displayed in graphical format, or stored in the internal datalogger, for evaluating the flowmeter's performance and sonic match of the transducers and pipe. The flowmeter shall have full HELP menu routines corresponding to all levels of programming and operation.

The flowmeter electronics shall be housed in a general-purpose enclosure and powered by 115VAC, 60Hz and an internal battery. Two loop powered isolated 4 to 20 maDC and 0 to 5000 Hz pulse outputs proportional to flow shall be provided. In addition, the unit shall provide two 0 to 10 volt outputs assignable to flow velocity, liquid sonic velocity, signal strength or liquid aeration. A bi-directional RS-232 connection shall be provided to allow remote programming and interrogation.

The flowmeter shall have an accuracy of $\pm 0.5\%$ to 2% of flow over a ± 40 fps flow range. Repeatability shall be $.15\%$ of flow with a flow sensitivity of 0.001 fps at any flowrate including no flow conditions.

Flowmeters that employ amplitude detection/correlation routines or use a single frequency or transducer design will not be acceptable. Shear mode flowmeters or meters utilizing wetted transducers or electrodes, or flow measuring techniques other than previously described will not be acceptable.

By use of either the transit-time or Doppler modes of operation, the flowmeter shall be capable of measuring all liquids in full sonically conductive pipes. Flowmeters that simply offer stand alone transit-time or Doppler measurement modes are not acceptable.

The furnished flowmeter shall be SITRANS FUP1010 IP 40 (NEMA 1) as manufactured by Siemens of Hauppauge, N.Y. or approved equal. Approval for a flowmeter, other than the specified flowmeter, will be given if the proposed flowmeter meets the specifications as established by the above and upon an actual successful demonstration of the equipment on the intended or similar application.

FUP1010SPEC SINGLE

SUGGESTED SPECIFICATION SITRANS FUP1010

Portable Submersible Multifunction Clamp-On Single Channel Transit-Time Flowmeter

The furnished flowmeter shall be of a portable clamp-on design precluding the requirement of penetrating into the pipe. In addition, the flowmeter shall be microprocessor based utilizing the transit-time flow measurement technique. The flowmeter shall employ the phase detection multiple pulse transmit principle in conjunction with multiple frequency axial beam transducer technology to insure operation on liquids with solids and or bubbles. In addition, the flowmeter shall incorporate an alternate Doppler method measurement mode for highly aerated or heavy solid bearing liquids.

The flowmeter shall provide automatic transducer spacing, Reynolds Number and liquid sonic velocity variation compensation and live zero flow measurement. The flowmeter shall have the ability to indicate flowrate, flow velocity, total flow, signal strength, liquid sonic velocity, liquid aeration and Reynolds Number. The flowmeter shall be equipped with an integral front panel keypad and multifunction 240 X 128 pixel LCD display. The flowmeter shall have internal memory of 1 MB for datalogging purposes. In addition, the flowmeter shall provide self and application diagnostics to isolate any fault conditions to either equipment failure or abnormal process conditions. Diagnostics shall also be displayed in graphical format, or stored in the internal datalogger, for evaluating the flowmeter's performance and sonic match of the transducers and pipe. The flowmeter shall have full HELP menu routines corresponding to all levels of programming and operation.

The flowmeter electronics shall be housed in a submersible enclosure and powered by 115VAC, 60Hz and an internal battery. Two loop powered isolated 4 to 20 maDC and 0 to 5000 Hz pulse outputs proportional to flow shall be provided. In addition, the unit shall provide two 0 to 10 volt outputs assignable to flow velocity, liquid sonic velocity, signal strength or liquid aeration. A bi-directional RS-232 connection shall be provided to allow remote programming and interrogation.

The flowmeter shall have an accuracy of $\pm 0.5\%$ to 2% of flow over a ± 40 fps flow range. Repeatability shall be .15% of flow with a flow sensitivity of 0.001 fps at any flowrate including no flow conditions.

Flowmeters that employ amplitude detection/correlation routines or use a single frequency or transducer design will not be acceptable. Shear mode flowmeters or meters utilizing wetted transducers or electrodes, or flow measuring techniques other than previously described will not be acceptable.

By use of either the transit-time or Doppler modes of operation, the flowmeter shall be capable of measuring all liquids in full sonically conductive pipes. Flowmeters that simply offer stand alone transit-time or Doppler measurement modes are not acceptable.

The furnished flowmeter shall be SITRANS FUP1010 IP 67 as manufactured by Siemens of Hauppauge, N.Y. or approved equal. Approval for a flowmeter, other than the specified flowmeter, will be given if the proposed flowmeter meets the specifications as established by the above and upon an actual successful demonstration of the equipment on the intended or similar application.

FUP1010SPECS SINGLE

SIEMENS

SUGGESTED SPECIFICATION SITRANS FUP1010

Portable Multifunction Clamp-On Dual Channel Transit-Time Flowmeter

The furnished flowmeter shall be of a portable dual channel/path clamp-on design precluding the requirement of penetrating into the pipe. The dual channel operating mode shall be capable of acting as two independent meters with the ability to perform math functions between the two channels (add or subtract). The dual path operating mode will eliminate the effects of flow profile distortion, cross flow or swirl errors caused by upstream interference or pumping irregularities. In addition, the flowmeter shall be microprocessor based utilizing the transit-time flow measurement technique. The flowmeter shall employ the phase detection multiple pulse transmit principle in conjunction with multiple frequency axial beam transducer technology to insure operation on liquids with solids and or bubbles. In addition, the flowmeter shall incorporate an alternate Doppler method measurement mode for highly aerated or heavy solid bearing liquids

The flowmeter shall provide automatic transducer spacing, Reynolds Number and liquid sonic velocity variation compensation and live zero flow measurement. The flowmeter shall have the ability to indicate flowrate, flow velocity, total flow, signal strength, liquid sonic velocity, liquid aeration and Reynolds Number for each channel or path. The flowmeter shall be equipped with an integral front panel keypad and multifunction 240 X 128 pixel LCD display. The flowmeter shall have internal memory of 1 MB for datalogging purposes. In addition, the flowmeter shall provide self and application diagnostics to isolate any fault conditions to either equipment failure or abnormal process conditions. The flowmeter shall have full HELP menu routines corresponding to all levels of programming and operation.

The flowmeter electronics shall be housed in a general-purpose enclosure and powered by 115VAC, 60Hz and an internal battery. One loop powered isolated 4 to 20 maDC and 0 to 5000 Hz pulse outputs proportional to flow shall be provided per channel or path. In addition, the unit shall provide one 0 to 10 volt outputs assignable to flow velocity, liquid sonic velocity, signal strength or liquid aeration per channel or path. A bi-directional RS-232 connection shall be provided to allow remote programming and interrogation.

The flowmeter shall have an accuracy of $\pm 5\%$ to 2% of flow over a ± 40 fps flow range. Repeatability shall be 0.1% of flow with a flow sensitivity of 0.001 fps at any flowrate including no flow conditions.

Flowmeters that employ amplitude detection/correlation routines or use a single frequency or transducer design will not be acceptable. Shear mode flowmeters or meters utilizing wetted transducers or electrodes, or flow measuring techniques other than previously described, will not be acceptable.

The furnished flowmeter shall be SITRANS FUP1010 IP 40 (NEMA 1) as manufactured by Siemens of Hauppauge, N.Y. or approved equal. Approval for a flowmeter, other than the specified flowmeter, will be given if the proposed flowmeter meets the specifications as established by the above and upon an actual successful demonstration of the equipment on the intended or similar application.

FUP1010SPEC DUAL



SUGGESTED SPECIFICATION SITRANS FUP1010

Portable Submersible Multifunction Clamp-On Dual Channel Transit-Time Flowmeter

The furnished flowmeter shall be of a portable clamp-on design precluding the requirement of penetrating into the pipe. In addition, the flowmeter shall be microprocessor based utilizing the transit-time flow measurement technique. The flowmeter shall employ the phase detection multiple pulse transmit principle in conjunction with multiple frequency axial beam transducer technology to insure operation on liquids with solids and or bubbles. In addition, the flowmeter shall incorporate an alternate Doppler method measurement mode for highly aerated or heavy solid bearing liquids.

The flowmeter shall provide automatic transducer spacing, Reynolds Number and liquid sonic velocity variation compensation and live zero flow measurement. The flowmeter shall have the ability to indicate flowrate, flow velocity, total flow, signal strength, liquid sonic velocity, liquid aeration and Reynolds Number. The flowmeter shall be equipped with an integral front panel keypad and multifunction 240 X 128 pixel LCD display. The flowmeter shall have internal memory of 1 MB for datalogging purposes. In addition, the flowmeter shall provide self and application diagnostics to isolate any fault conditions to either equipment failure or abnormal process conditions. Diagnostics shall also be displayed in graphical format, or stored in the internal datalogger, for evaluating the flowmeter's performance and sonic match of the transducers and pipe. The flowmeter shall have full HELP menu routines corresponding to all levels of programming and operation.

The flowmeter electronics shall be housed in a submersible enclosure and powered by 115VAC, 60Hz and an internal battery. Two loop powered isolated 4 to 20 maDC and 0 to 5000 Hz pulse outputs proportional to flow shall be provided. In addition, the unit shall provide two 0 to 10 volt outputs assignable to flow velocity, liquid sonic velocity, signal strength or liquid aeration. A bi-directional RS-232 connection shall be provided to allow remote programming and interrogation.

The flowmeter shall have an accuracy of .5% to 2% of flow over a ± 40 fps flow range. Repeatability shall be 0.5% of flow with a flow sensitivity of 0.001 fps at any flowrate including no flow conditions.

Flowmeters that employ amplitude detection/correlation routines or use a single frequency or transducer design will not be acceptable. Shear mode flowmeters or meters utilizing wetted transducers or electrodes, or flow measuring techniques other than previously described will not be acceptable.

By use of either the transit-time or Doppler modes of operation, the flowmeter shall be capable of measuring all liquids in full sonically conductive pipes. Flowmeters that simply offer stand alone transit-time or Doppler measurement modes are not acceptable.

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FUP1010SPEC DUAL