WI2200 System Overview

The WI2200 Post Weld Inspection System can measure tube/pipe weld and forming conditions in real time, providing continuous information on key process variables to mill operations staff. Both the Sensor Head and HMI console have been hardened for operating in a tube mill environment, protected from heat and electromagnetic interference (EMI), and physically shielded from environmental contaminants like dust, dirt, fluids, and steam to ensure correct operation and measurements.

Additional Documents

Drawing #	Description	Purpose
811-210-05	WI2200 Outline	Dimensions of WI2200 sensor. Required for determining position on mill.
811-210-06	WI2200 Head + Mount + Guards Outline	Dimensions of WI2200 sensor and provided mount. Required for determining specifications of customer provided mounting post.
812-221-05	HMI Outline	Dimensions of WI HMI.
812-241-03	Air Supply Outline, HMI and Sensor Cooling	Dimensions and configuration of provided air supply assemblies.
813-A41-04	WI2200 System Outline	Overview of components included in WI2200 system

NOTICE

The system power supply (e.g. 120V, 240V) and mill direction (left to right or right to left) must be communicated to Xiris at the time of order. The Sensor Head is only reversible at the factory, and certain electrical components are different depending on the power supply voltage.

Site Preparation

The following site preparation requirements are intended to ensure that the production facility is suitable and ready for installation prior to the arrival of the setup technician.

1. Mounting and Placement

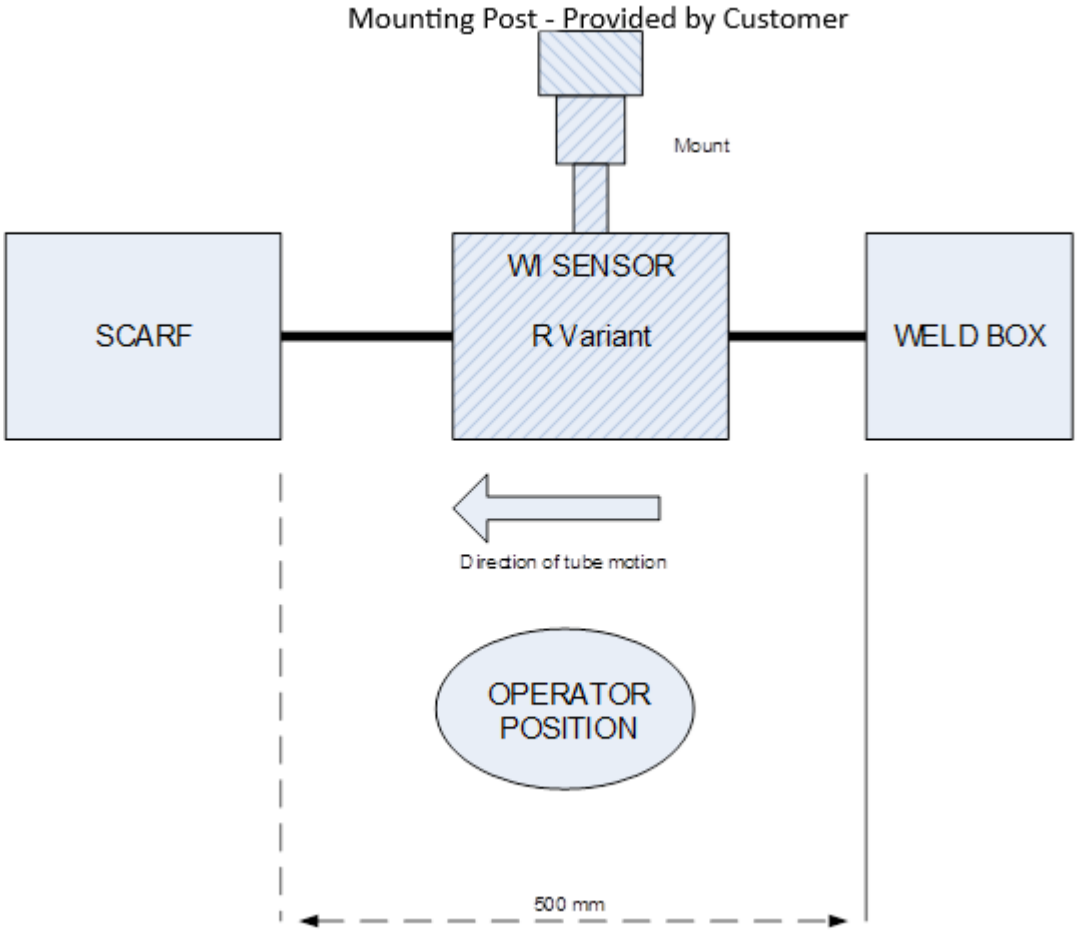

Figure 1: Plan View of Line (Right to Left Motion)

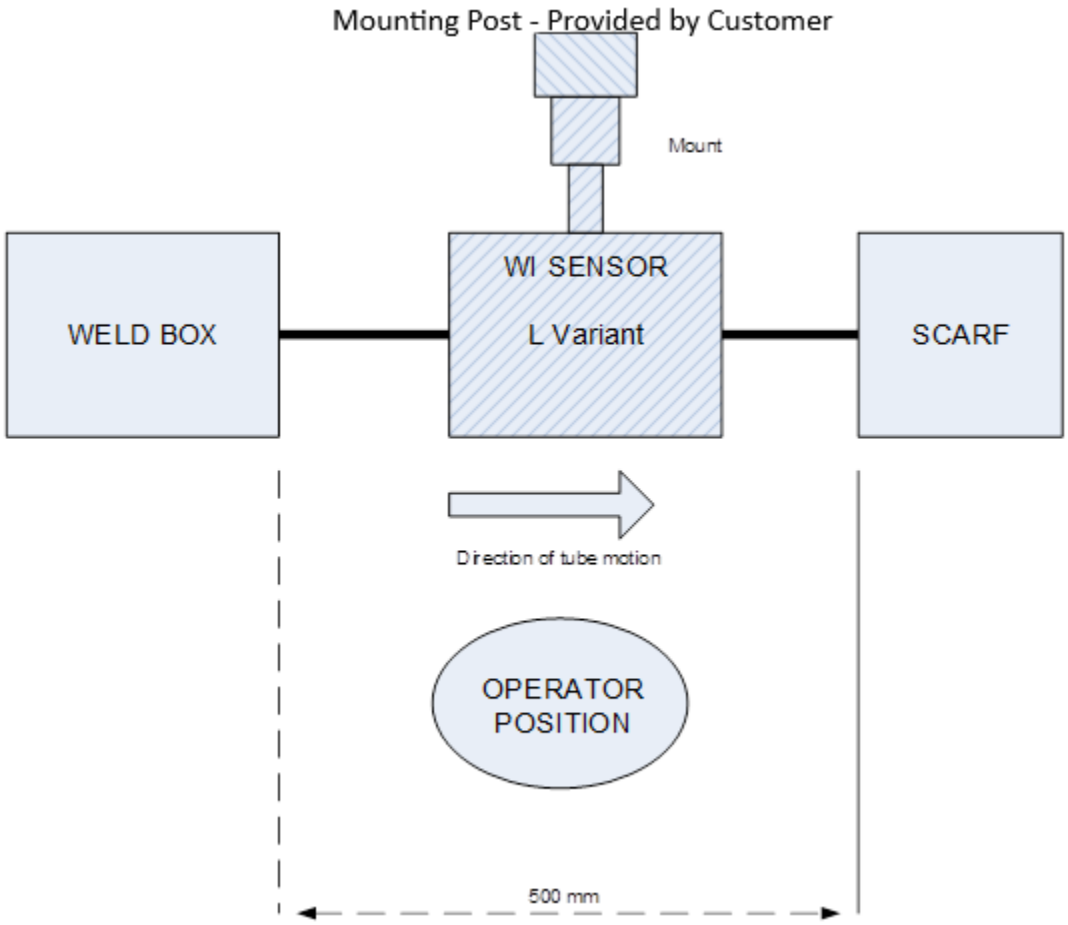

Figure 2: Plan View of Line (Left to Right Motion)

In a single sensor application, the WI2200 should be mounted after the weld box and before the scarfing tool. Consideration to the placement of the I.D. scarf tool should be given (if applicable), to ensure the sensor position does not interfere with tool changes. A minimum of 500mm space is recommended between the weld box and scarf tool.

In a dual sensor application, the second WI2200 sensor should be placed directly after the O.D. scarf tool, before any post-weld processes such as annealing, quenching, sizing, etc.

A customer designed mounting post should be attached to the mill to allow the WI2200 sensor to sit in the desired position (see drawing **811-210-06** for reference).

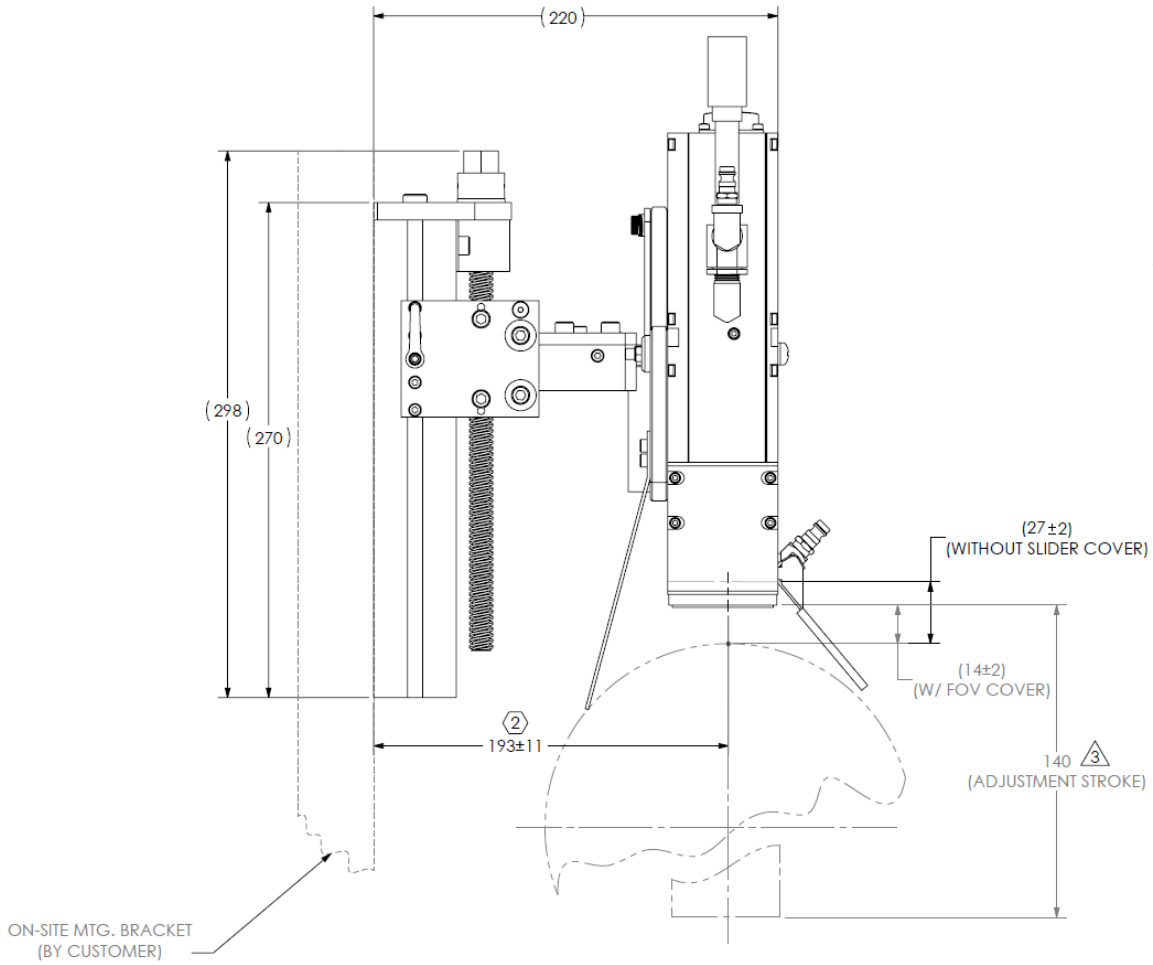

Figure 3: Sensor Mounting Position over Tube

The mounting stand provided by Xiris has 140mm of adjustment stroke. Care should be taken to allow the sensor to sit in the desired position across all O.D. ranges.

2. Air Preparation and Cooling

The WI2200 sensor is cooled via a vortex tube, supplied by high pressure air. The provided air knife can be mounted to the WI2200 sensor mount, and should be faced toward the weld box to prevent the accumulation of steam around the sensor. The slider purge air is designed to create a positive pressure air pocket inside the sensor, to prevent condensation of steam on the windows to maintain image quality. The specifications of the customer supplied air are as follows:

□	**Compressed Air for Sensor Head, HMI Cooling and Slider Purge**	○ Clean, dry, oil free air (Ideally ISO 8573.1 Class 1 air). ○ Sensor Head: 220 L/min @ 6 bar (8 cfm @ 90 psi). ○ HMI & Slider Purge: 708 L/min @ 6 bar (25 cfm @ 90 psi).

Air filter/regulators are provided with the system. The filters should be checked **weekly**. Once the filter has been saturated with oil or water, it should be replaced immediately (see replacement parts list, **Appendix A**).

The HMI and each WI2200 sensor have its own dedicated filter/regulator and solenoid plug for cooling control. The solenoid plugs are fed to a control box, where a single cable is connected to the HMI to control the cooling. The order of these cables is shown in the diagram below:

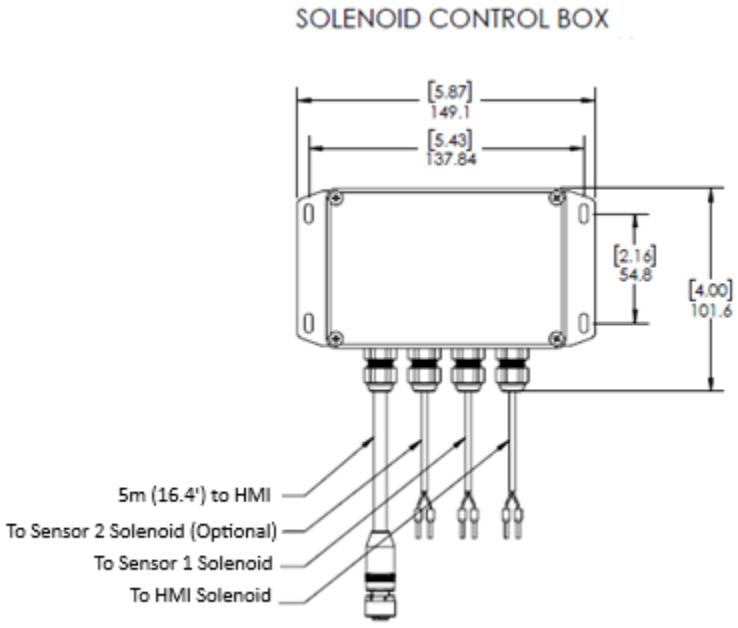

Figure 4: Solenoid Control Box

The filter/regulator for cooling the HMI is identified by a single 12mm push-to-connect outlet:

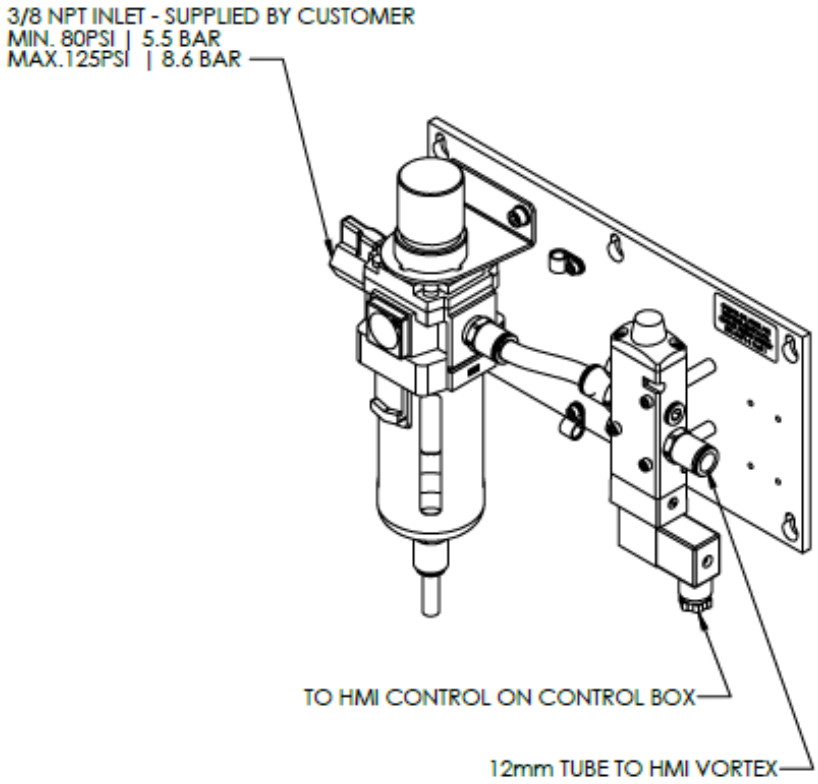

Figure 5: HMI Cooling Filter/Regulator

Single Sensor Configuration

In the case of a single post-weld or post-scarf WI2200 sensor being used, the control solenoid for cooling the sensor as well as the control solenoid for controlling the purge air will be combined with a single filter/regulator:

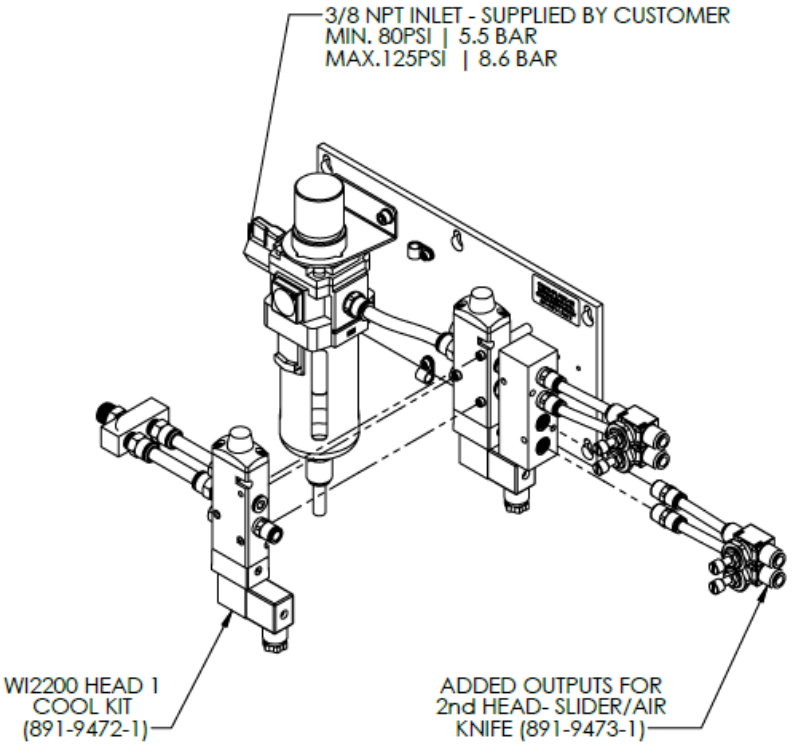

Figure 6: Single Sensor Cooling & Air Purge (Stacked)

The single 8mm push-to-connect fitting supplies the WI2200 with cooling. This solenoid is 12V$_{DC}$ and has a dedicated cable from the solenoid control box. The purge air solenoid is 24V$_{DC}$ and the wiring for this should be provided by the end user. A “Mill Running” signal is recommended to turn the purge air on with mill start.

Dual Sensor Configuration

In the case of dual post-weld and post-scarf WI2200 sensors being used, the control solenoid for cooling both sensors will be combined with a single filter/regulator:

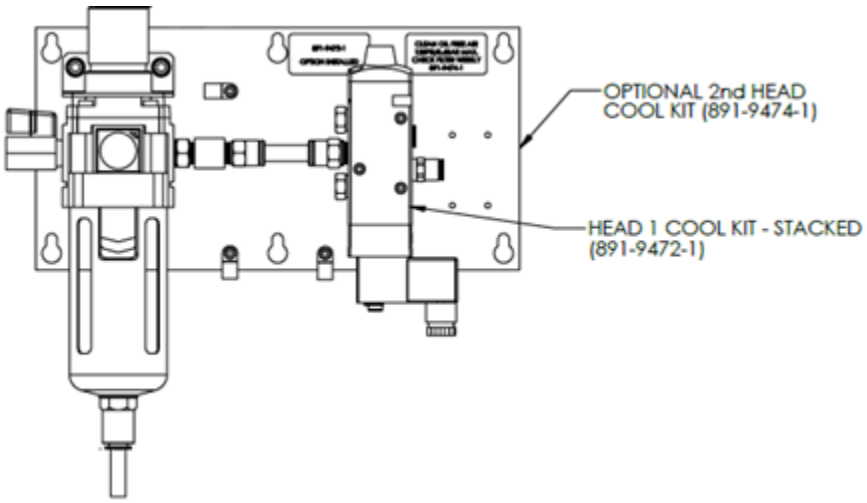

Figure 7: Dual Sensor Cooling (Stacked)

Each solenoid in this configuration has a single 8mm push-to-connect output, dedicated for each WI2200 sensor. The solenoids should be connected to the provided solenoid control box.

The purge air filter/regulator will be provided on its own panel, with 4x 8mm push-to-connect outputs:

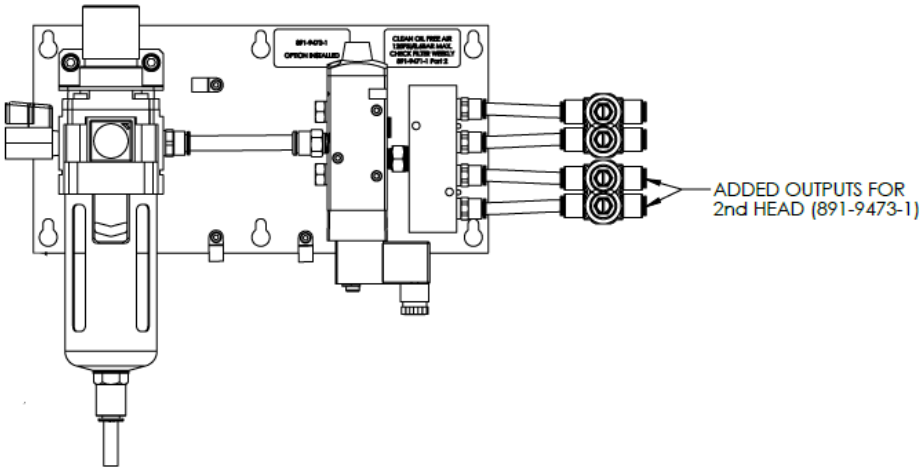

Figure 8: Dual Sensor Purge Air

The following air connection diagram provides an overview of air connections for both single and dual WI2200 sensor configurations:

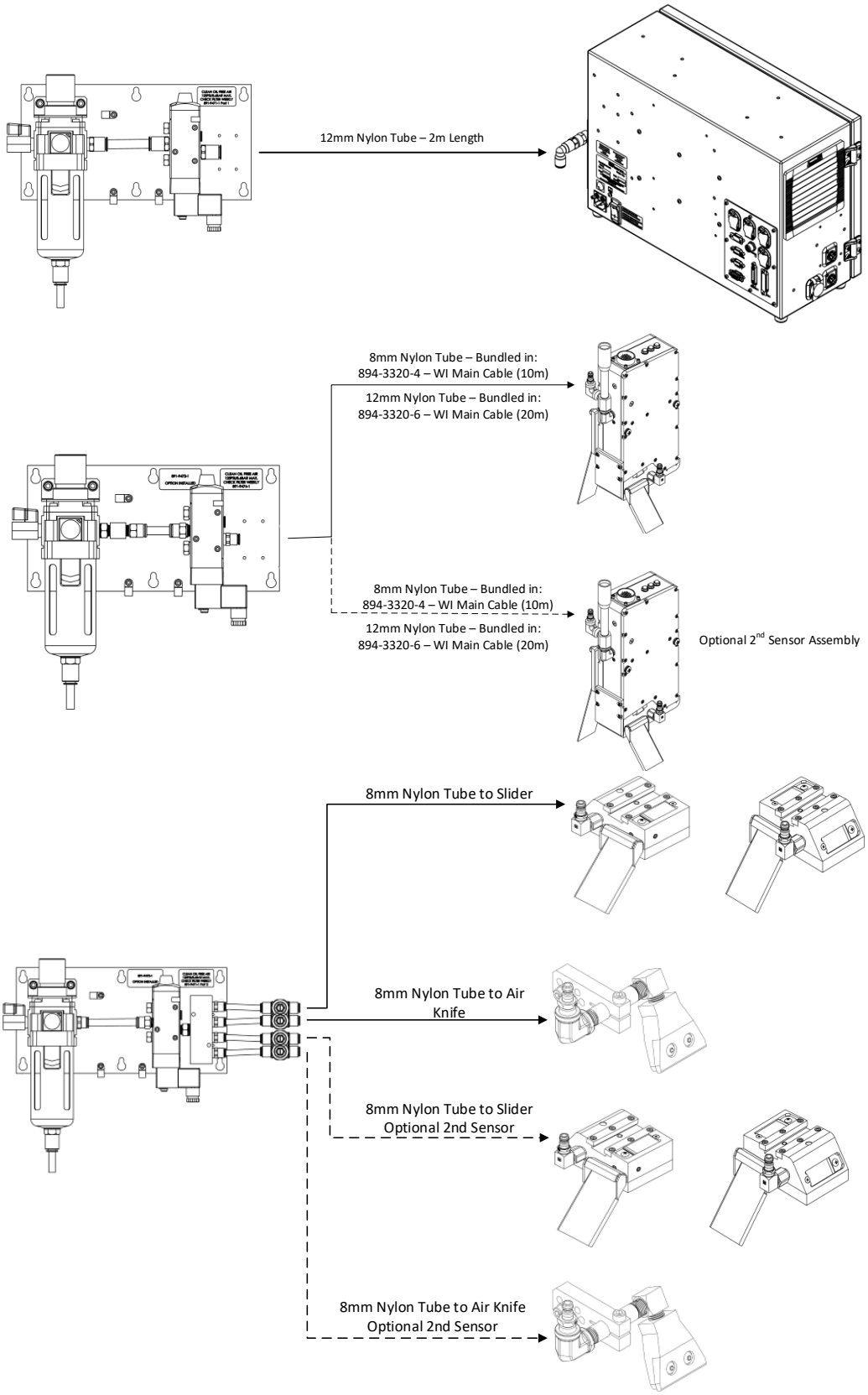

Figure 9: Air Connection Diagram

3. Electrical

A grounded electrical outlet is required, supplying 100 - 120 V_{AC} or 200 – 240 V_{AC}, 50 - 60Hz.

The HMI is supplied with a regional power cord. The North American cords have a NEMA-5-15P plug; the European cords have a CEE 7/7 plug.

4. HMI Connections and Mounting

All electrical connections for the WI2200 system terminate at the HMI rear panel. The rear panel is clearly labelled to provide the end user with correct termination points. The following diagram provides an overview of peripherals, their connections, and associated cable part numbers:

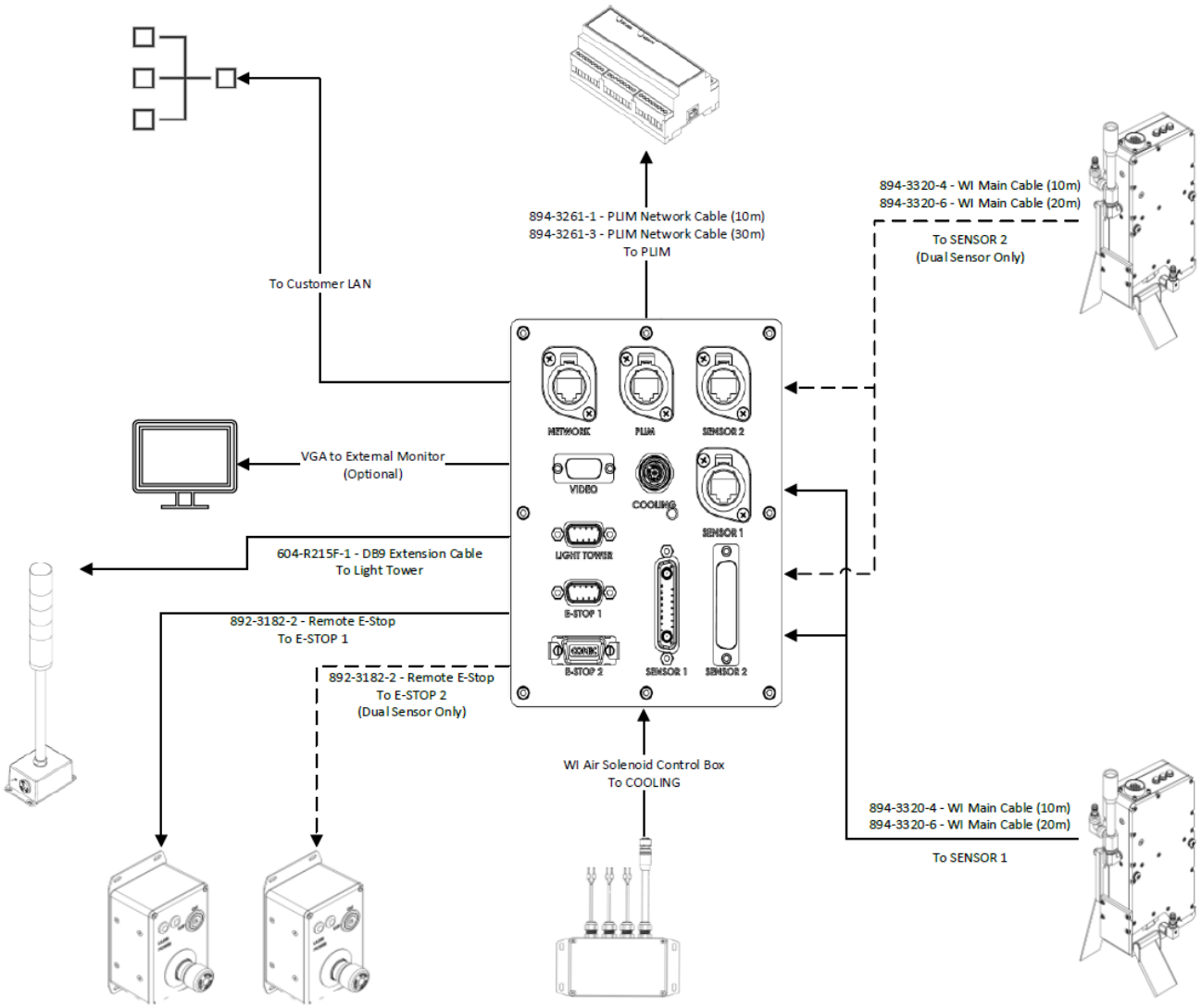

Figure 10: HMI Connection Diagram

The HMI rests on 4 rubber feet for stability and to reduce vibrations. The existing M4 threads for these feet can be reused to mount the HMI:

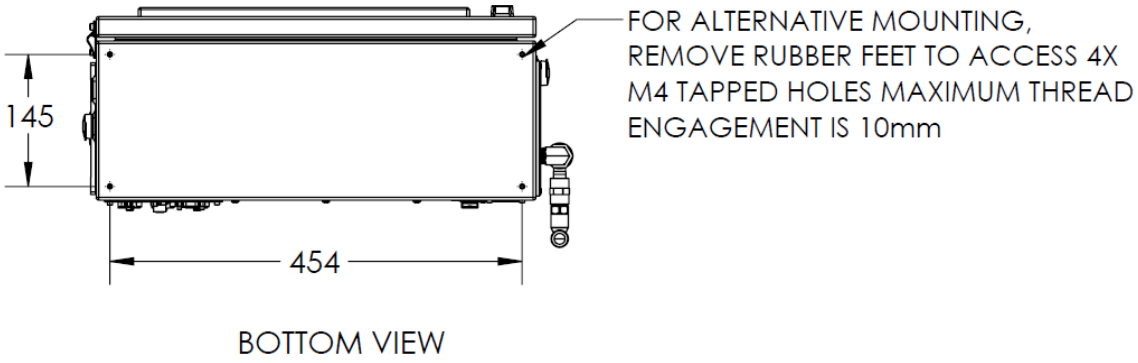

Figure 11: HMI Mounting (Bottom View)

The HMI is also provided with optional VESA 100x100mm or 100x300mm mounting holes on the back:

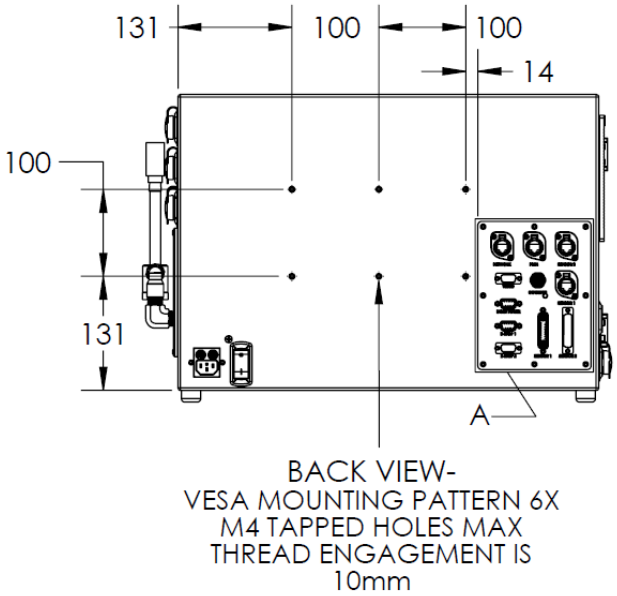

Figure 12: HMI Mounting (Back View)

Appendix A – Recommended Spare Parts

WI2X00		
Part Number	**Description**	**US List Price**
201-2067-1	Protective Window (each) - WI2X00	$ 40.00
880-00141	Protective Window (set of 10) with screws WI2X00	$ 260.00
891-9480-1	WI2X00 Slider Assembly, R-L Mill Direction - (Specify System Serial # when ordering)	$ 1,020.00
891-9480-2	WI2X00 Slider Assembly, L-R Mill Direction - (Specify System Serial # when ordering)	$ 1,020.00
880-01341	WI2X00 Slider Window Spring Clamps Kit	$ 40.00
891-9325-X	Pivot Plate Sub-Assembly, for WI2X00 Sensor Head - (Specify System Serial # when ordering)	$ 850.00
891-9326-X	WI2X00 Sensor Head Mounting Assembly - with vertical and horizontal adjustment - (Specify System Serial # when ordering)	$ 2,890.00
Universal		
172-000092	AIR-FIT, FILTER, Replacement Filter for SMC AWD40 Filter/Regulator, 0.01 Micron	$ 160.00
891-9352-4	Protected Air Hose (3 per WI2200, 4 per WI3000)	$ 190.00
894-3261-1	CABLE, PLIM+ Network Cable, 10m	$ 260.00
894-3261-3	CABLE, PLIM+ Network Cable, 30m	$ 340.00
894-3320-4	WI Armored Main Sensor Cable, 10m	$ 1,450.00
894-3320-6	WI Armored Main Sensor Cable, 20m	$ 2,480.00
894-3191-21	VGA Extension Cable	$ 200.00
880-00091-1	KIT, HMI Console Air Filter (Pkg. of 10)	$ 260.00
880-00171-1	HMI replacement door key kit (pkg of 2)	$ 130.00
896-1000-1	Replacement Laser Safety Warning labels (Complete Set)	$ 60.00
319-0103M-1	Computer Power Cord - North America	$ 50.00
319-0103M-2	Computer Power Cord - Germany	$ 50.00
601-CGIGE-3	Dual Port GigE Controller Card	$ 160.00
880-00951	HMI Door & Monitor Assembly	$ 2,530.00
603-KB0001	Keyboard with integrated Mouse	$ 190.00
502-WIN-010	Windows 10 Pro License	$ 410.00
604-R215F-1	Light Tower Cable	$ 40.00
880-00122	Production Line Interface Module (or “PLIM+”) with 10m cable	$ 1,240.00
891-9264-4	Light Tower Assembly	$ 1,030.00
892-3182-2	Remote Estop Assembly	$ 830.00