

The Motion Tech News

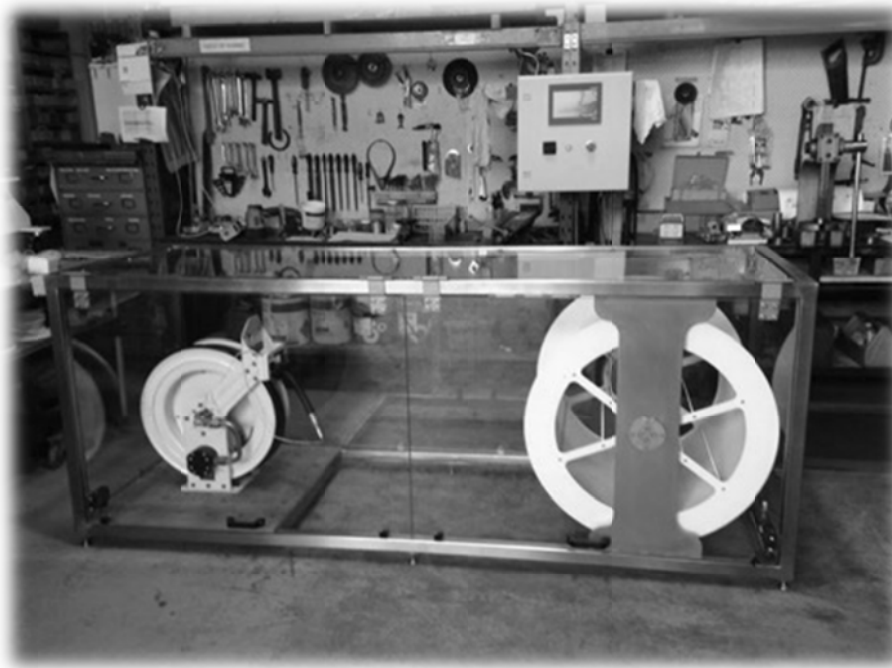
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NEWS FOR TODAY

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Another solution found!

Real time data on hose reel testing machine



Hose reel testing machine

An Australian manufacturer of hose reels requested we develop a diagnostic machine that records force requirement on extending and retracting a hose from its reel. This sounded simple, though it wasn't. This was to test 3 main purposes for life cycling of the product. That is: 1. Testing the ratchet pawl and spring mechanism. 2. Life cycling of the hose material. 3. Laying of the hose onto the reel as customer does not use a hose laying device which is typically an archimedes screw built into a hose reel. The mechanical scope was decided to have a direct drive servo motor with a winding drum attached to it. In the photo you will see the drum has been excessively lightened in weight to reduce the inertia and the benefit of the direct drive motor is its

reading phase amperage. The motor chosen had capabilities of 80Nm of torque output utilising only 6 amps of power. Being direct driven also meant we were not dealing with inefficiencies of the gearbox reduction, etc. The motor feedback was 21 bit, single turn absolute which makes homing the start position easy without the need of additional home switches. The drum was deliberately made big in diameter so a full 20 metres of hose could be wrapped at a specific diameter. The test rig was made in polished stainless steel with lexan panels with interlocks. This is a display machine as well and had to look good for the customers, customer. The customer was very happy with the final presented product.



Under Control

Motion Technologies designed a HMI interface and utilised a Trio motion controller on EtherCat to control a Kollmorgen servo drive. The Trio was chosen as it is a dedicated motion controller and not just a PLC. The touch screen user interface had manual and automatic run, though specifically has a teach page, where the operator could simply jog the winding drum to a given position and teach the position along with speed and few other functions requested. The motion program was written in compiled C++ running in the background, not seen by the customer. In the teach program a time is set by customer for cycle operation and time interval for taking samples. When the machine is operating, and sample time is set to 100 msec, the motion controller requests from the servo drive the phase current on each phase, and looks for highest value and collects actual speed. This is then written to a table with a time stamp in the motion controller. Once the machine cycle is finished the table is saved to an SD Card which then exported into Excel. Servo motors produce a specific torque per amp so knowing amps, means you know torque which in turn means you know force.