

ISSUE 1 - MAY 2018

QUARTERLY NEWSLETTER FROM AUTOMATED SOLUTIONS AUSTRALIA

AXIS

MEET THE **ASA TEAM**

SQP PROJECT
WESTERN AUSTRALIA

ASA CELEBRATES
15 YEARS IN BUSINESS



FROM THE **GENERAL MANAGER**



Welcome to our first newsletter.

After 20 years in the Automotive manufacturing industry, and the past 13 years working for General Motors Holden in a paint engineering capacity, I am very pleased to now be part of the team at Automated Solutions Australia (ASA), working as the General Manager.

This year ASA celebrates 15 years in business. Our team are very proud of this significant milestone and look forward to many more years supporting the Robotic and Automation industry in Australia and throughout the world.

At ASA we are driven to be the best within the industry, we are dedicated to bringing you the most innovative and world class solutions available to meet your everyday manufacturing requirements.

Inside this edition we share a little bit about some of our current projects, highlighting some of the benefits of converting to automation. We get to know a little bit more about the team members at ASA and provide you with an article about what makes a paint robot safe. I trust you will find it informative and enjoyable.

Brenton Cardone, General Manager



WHAT MAKES A **PAINTING ROBOT SAFE?**

The Concept of Intrinsic Safety & Purge Systems on Automation

Flexible automation offers a fast and accurate means of performing repetitious tasks in the manufacturing sector, often under extreme conditions. In some extreme manufacturing environments, such as those experienced in the atmosphere of a paint spray booth, purpose built robots are required. These robots are designed to be explosion proof, with built in purge systems for safe operation in a combustible environment.

In order for a robot to operate safely in a combustible environment, a purged air cavity is required to negate the effects of a possible spark from the robots' servomotors. The purge circuit, which is crucial to the successful operation of the robot, is not that simple. Before power can be applied to the servomotors of a robot designed for use in a paint environment, the controller activates a purge cycle. This consists of flooding an enclosed, sealed cavity (there is a check valve allowing air evacuation from the cavity) with 55 psi (dynamic flow)

of clean, dry, compressed air. There is a flow switch mounted within the cavity that makes contact when this level of airflow has been detected. The controller then requires the contact to be held for 5 minutes, thus ensuring that any organic/combustible vapors have been evacuated from the cavity, creating an artificial atmosphere of fresh air, around each of the servomotors.

Following the completion of the purge cycle, the system switches to maintenance mode (maintenance of purge). This requires a low-pressure switch, which monitors ambient air, external to the robot, versus internal air. A differential pressure of 75 to 125 mm H₂O or greater is required to maintain positive pressure, thus ensuring that impure air is kept out of the cavity. In the event that the maintenance purge is lost, all power is removed from the servomotors, thus avoiding the potential for explosion.

The timing of the purge cycle (in conjunction with the square area of the cavity), as well as the design of the maintenance

air requirement is dictated by the safety organizations that provide their stamp of approval for classifying a robot as safe to use in a hazardous environment. In the U.S.A., this agency is Factory Mutual, or FM, in Europe, ATEX and in Japan, TIIS. Any company that plans to install an electric robot into a National Fire Protection Association (NFPA) Class 1, Division 1 (combustible) environment should be very strict in requiring these approvals on the products, or risk the liability of any associated damages from an accident.

In addition to the robot purge circuit, many additional safeguards are built into a robotic system to guarantee that make-up and exhaust air are present, that fire/spark detection equipment is active, fire suppression systems are engaged and interlocks are provided to remove the sources of combustion (paint supply, air supply and electricity), in the event that a fire is detected.

MEET THE **ASA** TEAM



Michael Boonzaayer has 14 years experience working for ASA in the robotic automation industry as a process and installation engineer on a large number of projects across a wide variety of countries.

Michael started his career as an installation engineer, installing and troubleshooting systems electrically, mechanically & pneumatically. This gave Michael the opportunity develop in depth knowledge of how the system works from the ground up. Michael spent the first half of his career based at Holden installing over 40 paint robots in a support role and leading all breakdowns and continuous improvement activities. Michael was able to build a great knowledge base to quickly troubleshoot and solve any issues that would arise.

Michael is experienced installing, programming and trouble shooting industrial robots (tending, polishing and welding) as well as paint and sealant dispensing robots. He has worked closely with countless manufacturing quality engineers to optimise their robotic application processes in their facility and he has attained valuable experience with solvent borne and water borne paint, 2K paint processing, as well as sealant applications.

What has been your favourite robot to work with?

I have worked on a whole range of different robots over the years. But If I was to choose one, I would say that I enjoy working on the Fanuc P700. This robot is really flexible, advanced and very versatile. It's also very fast and reliable.

A P700 robot is normally coupled with a door, Hood or Hatch opener robot which are all attached and track along a rail. Interior cut in paint processing is probably my favorite type of painting application as it is complex with many robots communicating between each other. I enjoy the challenge of creating advanced programs which are all smooth and efficient as well as being easy enough for the plant personnel to follow and be able to make changed if necessary.

Favourite country you've worked in?

I have travelled to many different countries with ASA including Egypt, China, Mexico, India, America, Canada, Thailand, Argentina, and Korea to name a few.

It's hard to pick a favorite country as they are just so different from each other. I love to get into the culture and trying each country's foods and traditions. Visiting Egypt's pyramids this year at a GM project we executed was a definite highlight!

As many countries as I have travelled to, one thing I can say is that with each new plant I visit, I've been lucky enough to form close relationships with all of my customers. I work hard for them and we really work as a team. No matter which country, which customer and what job it is, the customer and ourselves have the same goals. We both want the project to run on time, on budget and exceed quality expectations.

Our attitude has always naturally been to work with the customer rather than for the customer. This has always proven to work really well as together we all own the project and strive for success.

Annual Robot Servicing

Has your robot had its annual service?

Just like a car needs regular servicing, so too does your robots. Your robots work hard for your business, sometimes operating 24 hours a day for long periods so annual servicing of your robots (such as greasing, battery replacements, checking for excessive wear and measuring back lash, etc) will ensure your FANUC robots remain in optimal condition, ensuring great repeatability of movement and providing you with a great quality outcome for your processes.



SQP PROJECT WESTERN AUSTRALIA

About the project

SQP Engineering is a highly regarded supplier of precision machined products in Bibra Lake, WA. SQP boasts a team of highly talented and experienced tradesmen led by the husband and wife team of David and Heidi Miller. SQP stands for Service, Quality and Products, as those are the principles and objectives the company was founded upon and continue to be led by.

SQP have had a long and prosperous relationship with Okuma Australia, having installed a fleet of Okuma's high quality CNC lathes and mills tools over a steady growth phase that is in to its second decade.

To gain the most out of SQP's most recent addition, the Okuma LB4000 lathe, Automated Solutions Australia was chosen to install and commission a robotic tending system that allows the machine to run unattended for long production runs,

Robot type used

A Fanuc R2000iC/125L robot was installed and commissioned with an ATI gripper changeover device that allows the robot to change from one gripper to another as required by the specific product being produced. A 3 jaw gripper is used for handling billet parts while a 2 jaw gripper is used for handling bar stock. The system is designed to use pallets with changeable profiles for easy arrangement and location of blank parts. Machined parts are returned to the pallets and can be replenished during production. Bar stock enters the cell through a bar feeder or through an inclined feeder and exits the cell through a decline chute.

The cell controller incorporates ASA's easy to use robotic machine tending interface which allows the user to simply program new products by entering some basic setup dimensions and saving those for future selection. The system incorporates a database that stores different pallet configurations and product configurations so recalling them in future requires simply choosing the product from a dropdown list.

Benefits to the customer

The key benefits of this system are quick setup and run times, intuitive control removes the need for onsite robot expertise, long unmanned production runs and the flexibility to add supplementary tasks such as parts washing, deburring or assembly if those opportunities arise.

ABOVE - SQP HMI screen

BELOW - SQP cell 01



1800 ROBOTS (1800 762 687) for 24 hours a day robot support

Did you know Automated Solutions Australia has a 24 hour a day robot support number for our customers to call in the event of a breakdown?

The number is **1800 ROBOTS**

AUTOMATEDSOLUTIONS.COM.AU

FANUC R-2000 ROBOT SERIES

FANUC R-2000 robots, the most successful FANUC robot series in the world.

The R-2000 series are one of the most versatile robot series on the market and are used in a vast range of industries from Aerospace, Logistics, Machine tooling, Food and Beverage, Automotive and General Industry and its the robot series that ASA chooses very frequently when tending machine tools.

The R-2000 series can be specified in a number of different ways to suit your businesses individual needs from pedestal, rail mounted, upside down mounted, compact or top mounted robot and is able to be fitted with almost any type of spot welding guns or grippers. Easy to fit upgrade kits are also available, allowing for additional options for your robot, such as the addition of a vision system. If you have a facility that creates dust or uses water within the process then there are options available that can provide dust and water protection for the R-2000.

The R-2000 has the perfect mix of reach and payload for medium to large machine tending applications. Within it's range, there are options for 165kg to 270kg at the reach of 2655mm which are perfect for tending one machine and loading/unloading from a

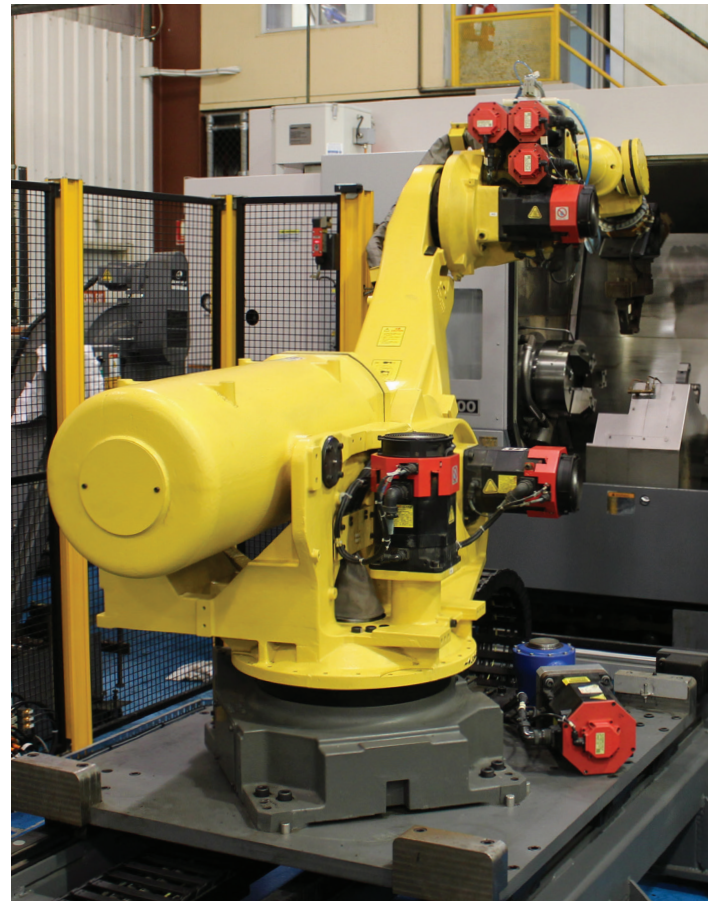
couple pallet or infeed/outfeed bays. Then there are longer reach R-2000 robots, with a reach of 3100mm and payload options of 125kg to 210kg. The longer reach robots are perfect for when there are two machines for the robot to tend to.

The beauty of using these robots to tend medium to large machines is that the heavier machines and workpieces tend to have longer run times and considerably longer changeover times from workpiece to workpiece. Larger workpieces frequently require that personnel need to attach slings and/or magnets to the part for unloading, and then again to the part being loaded. When cycle times are longer, the machine often completes its cycle and waits for personnel to respond. That wait time tends to extend as cycle times extend. Heavier workpieces sometimes require more physical interaction during loading and unloading which puts personnel at increased risk of strains as well as the typical cuts and pinches that can occur.

The bottom left image shows a long reach R-2000 with 185kg payload which changes from a 2 jaw gripper to a 3 jaw gripper as required to load and unload 80kg work pieces into a Mazak e500 and a Mori Seiki NT5400. The long reach allows the robot to reach over the operator platforms in front

of each machine during normal operation. When the robot isn't unloading or loading the machines, the operators can come and go as they please to inspect the progress or to take measurements mid cycle. As soon as the cycle is complete, the machine is tended by the robot and the spindles are turning again in under a minute. With no change to the machining cycle, these machines went from producing 8 pieces per shift on each machine to 11 pieces per shift on each machine simply by drastically reducing the end of cycle response time and the time to change workpieces over. Access to a number of grippers supports a greater range of products and also various loading/unloading configurations in multiple operation processes.

The bottom right image uses a twin gripper to unload and reload the workpiece very quickly. The robot is mounted on a linear rail and is tending three Okuma Multus multi-function machine tools. The image shows the robot reaching through the guarding that operates to provide a shared operator/robot workspace in front of the machine tool. When the robot has completed the workpiece changeover, the sliding gate closes allowing full access to the machine by plant personnel.



**1800 ROBOTS (1800 762 687)
for 24 hours a day robot support**

MAILING ADDRESS

GPO BOX 1090
ADELAIDE SA 5001

ADELAIDE

UNIT 2, 80 HOGARTH ROAD
ELIZABETH SOUTH SA 5112

MELBOURNE

UNIT 2, 13-21 THOMAS STREET
YARRAVILLE VIC 3013

UNITED STATES

2960 BOND STREET
ROCHESTER HILLS, MICHIGAN 48309

AUTOMATEDSOLUTIONS.COM.AU

