New compact ID robot improves accessibility and precision

ABB, with an installed based of more than 250 000 robots, is a leading global supplier of industrial robots. *African Fusion* talks to ABB South Africa's robotics business unit manager, Ragnar Tonnessen (left), about the new IRB 1660ID, a high performance mid-range robot that allows cables and hoses to be routed inside the upper arm making it ideally suited to arc welding.

ABB's IRB 1660ID offers shorter cycle times, unmatched versatility and a smaller more powerful wrist.

Unveiled globally in June 2016, ABB Robotics' latest compact robot for arc welding and machine tending, the IRB 1660 Integrated DressPack (ID), is arguably the most versatile robot in the mid-sized class. This largely due to the new robot's hollow wrist, which makes it easier to program and simulate predictable cable movements.

"The hollow wrist allows the welding hose pack and cables to be housed in the protected space inside the upper arm. This enables better cable handling and easier torch access when space is restricted," Tonnessen explains, adding: "The shorter and more compact wrist also improves the robot's stiffness and end-point accuracy."

The new design is suitable for a variety of applications requiring fast, repeatable and highly accurate point-to-point or path following movements. ABB's 1660ID is ideal for customers requiring maximum productivity in high-robot-density arc welding applications or for machine tending applications in confined spaces.

Capable of carrying heavier welding torches – the payload is up from 4.0 kg to 6.0 kg compared to the IRB 1600ID – more powerful drive motors enable higher acceleration and deceleration rates. "These advantages, along with less need to slow down the robot arm to protect swinging external cables, result in shorter cycle times – reduced by up to 10% – and more predictable performance.

"The demand for superior and even quality in arc welding applications has increased, requiring improved wire feeding control near the arc to guarantee high volume production," explains Tonnessen. "The IRB 1660ID has a stronger more rigid upper arm able to lift up to 6.0 kg to accommodate heavier torches. This, combined with ABB's TrueMove™ technology and the new 'accuracy mode' provides 0.05 mm path repeatability (RT) for excellent welding results," he adds. In addition, position repeatability (RP) of 0.02 mm can be achieved and average TCP re-orientation accuracy is at 0.3 mm.

The IRB 1660ID with the aid of RobotStudio®, ABB's premier offline robot software programming tool, enables robot programmers to envision high density cells with several robots welding close to each other to reduce work piece heat distortion to a minimum. RobotStudio simulations help to secure safe robot movements with high speed and accelerations at all times to provide predictable and shortest possible welding paths and cycle times. "Such high-density cells can maximise output, provide quality parts and operate with unmatched reliability," Tonnessen advises, adding, "and slender profiles offer excellent access for welding inside narrow or internal spaces."

Welding is a key growth area for robot use, particularly among Tier 1 and 2 automotive components manufacturers.

From a safety and reliability perspective, the compact and hollow wrist enables fast and reliable movements since the robot can move at maximum acceleration and speed without damaging the dress pack. The risk of collision in confined spaces is also reduced. The combined working range of axes 4, 5 and 6 is 1 390° which provides excellent agility and, for welding, the ability to complete 360° weld seams without having to stop for torch repositioning, thereby also reducing weld discontinuity risks.

"The robot wrist is IP67 ingress protected, which means that it is 100% protected against dust, electrical contact and water.

These advantages, combined with better movement control, amount to up to 50% lower maintenance costs and an associated longer equipment life.

According to Tonnessen, welding is a key growth area for robot use, particularly among Tier 1 and 2 automotive components manufacturers. "We also see robots being used increasingly for machine tending on assembly lines, offering up components for spot welding in stationary guns, for example.

"Although new robot installations in South Africa have been declining in recent years, we now see increased interest as more people become convinced that robotics and automation can be employed to significantly improve global competiveness and end-product quality," he concludes.