

A 360° integrated TIG-welding solution

for welding at heights

Specialist gas and welding market leader, Afrox, has developed a forward-looking gas delivery solution for TIG welders working at heights on high-integrity pipework. *African Fusion* talks to the development team: Arnold Meyer, applications development manager; Roberto Dionisio, R&D manager for Hardgoods; and Johann Pieterse, business manager for manufacturing industries.

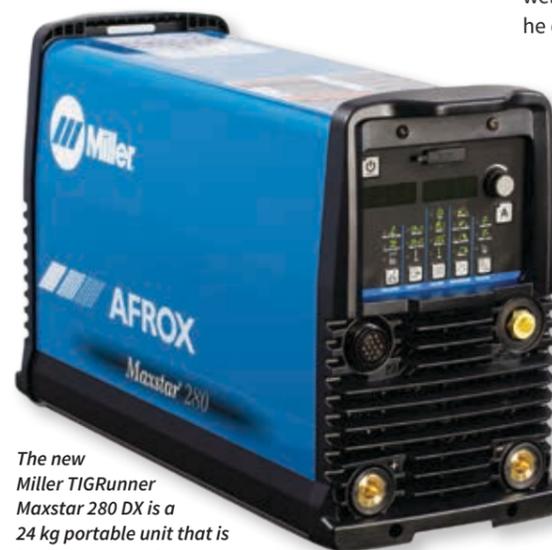
the next step is to create an effective solution that will result in increased productivity, lower production cost and improved quality – and this all hinges on maintaining a safe working environment,” he continues.

Working at heights is one such customer challenge, as contractors are faced with multiple safety risks and challenges. Particularly when welding, not only does the welder have to deal with having to produce the highest integrity welds while tethered to a safety harness hundreds of metres in the air, he or she is also required to bring up welding equipment and cylinders of shielding gas before the work can begin.

In order to soften the difficulties encountered, Afrox has used its 360° solutions’ ethos to develop a reliable and convenient solution for the delivery of argon shielding gas to TIG welders working at height, coupled with a range of portable high-end welding machines that make quality welds easier to achieve.

At the starting point of this solution is Afrox’s patent-pending multi-user pressure panel (MUPP), an innovative design that removes the need for shielding gas cylinders to be lifted to the welding level. “The MUPP enables separate argon torches to be supplied to multiple TIG welders working on the plant’s piping. And the panel is not a manifold. Through this pressurised user panel, each welder draws a constant pressure and flow, regardless of how many welders are working,” explains Johan Pieterse.

“This completely eliminates the need to transport and lift bulky, heavy cylinders and cylinder packs onto elevated platforms, which results in a much safer working environment with improved



The new Miller TIGRunner Maxstar 280 DX is a 24 kg portable unit that is ideal for connecting to an MUPP for TIG welding at height.

quality and productivity and reduced operational costs.” he adds.

Describing how the system works, Arnold (Arri) Meyer says that the MUPP is connected to a gas supply on the ground via a stainless steel braided hose. “The MUPP is connected to a bulk gas supply at ground level, which can be a manifolded cylinder pack (MCP), which, for argon, consists of a pack of 15 200 bar cylinders; a portable cryogenic container on a skid (PCC); or a permanently installed cryogenic bulk supply, depending on the welding requirements and the construction duration,” Meyer tells *African Fusion*.

From the ground supply, the gas is regulated down to a pressure of 10 bar and fed through a reinforced braided stainless steel hose to the MUPP at the welding level. The lower pressure and flow rate into the MUPP means that the pressure losses are relatively low – less than 0.5% – so the MUPP is at nearly the same pressure.

The MUPP also contains a gas reservoir, which ensures that the volume needed to feed eight welders simultaneously is available at any time, so when everyone starts welding at the same time, or if someone’s gas line is accidentally cut, the gas flow to welders remains steady and uninterrupted.

“Each line has its own low-pressure regulator with a settable flowmeter that regulates the gas to the required flowrate, typically 10 to 15 l/min. Each welder therefore receives exactly the gas he or she needs as if it was being delivered from a cylinder,” says Meyer.

“What we currently see on any construction site where pipework is being welded are individual cylinders standing on platforms at the welding level – and the boiler houses are as high as 130 m. So every MUPP we put into these sites immediately reduces the number of cylinders that have to be taken up to the top of the construction by eight. In addition, no empty’s have to be taken down or replaced,” continues Pieterse.

Key features of Afrox’s MUPP supply solution include:

- The system contains a pressurised reservoir for stable flow and surge control.
- Eight control valves allow individual shut off capability.
- Individual flow control is available via eight separate flow regulators.
- Variable length stainless steel braided supply hose can be supplied depending on the height requirements of individual projects.
- On the supply side, a single supply regulator and gauge can be used.
- The system is safe, with pressure relief valve protection.
- Portable stands are available if required.

Also in the final stages of development is a new all-in-one regulator and flow meter that offers precisely settable gas flow settings from a single dial. “This is an extension of our SmoothFlo innovation, which was developed here in South Africa,” says R&D manager, Roberto Dionisio.

The new flow regulator, specifically developed for shielding gases, strives



A ground supply of Argon is fed through a reinforced braided stainless steel hose to the MUPP at the welding level. Eight welders using Miller TIGRunner 280 machines can then independently control their gas flow.

to deliver robust, simple, accurate and very consistent gas flow for welders, who will be able to preset the flowrate on a simple dial without having to check the position of a small suspended ball from the distance of their welding position.

Also, while Afrox’s MUPP and gas flow control solution can be used with any TIG welding equipment, the company’s 360° solution’s thinking has led the development team to couple this solution to the new Miller TIGRunner welding machine, which is ideal for high-integrity applications where on-site portability is needed or access to difficult to reach places.

“Our new TIGRunner Maxstar 280 DX is a nice portable unit that is ideal for connecting to an MUPP for TIG welding at height,” suggests Pieterse.

Available for use with air- or water-cooled TIG torches, these machines weigh less than 24 kg and are ideal for pipe welding of materials up to 10 mm thick. The ac/dc TIG/Stick power sources features an energy-efficient inverter design with Auto-Line™ technology, which enables them to run on almost any ac input power (208 to 575 V) without the need for manual linking of connections. Auto-Line also smooths power fluctuations so that the welding current being delivered remains accurately regulated, therefore protecting the end quality of the weld.

Being software driven, a front panel memory card data port provides the ability to easily upgrade the machines’

control software and expand its features. In addition, the pre-programmed welding parameters available via Miller’s Pro-Set™ system eliminate the guesswork when setting welding parameters.

“These new generation machines incorporate Miller’s Blue Lightning™ high-HF starting system – essential for high-integrity pipe welding where lift starting is unacceptable – which is renowned for providing more consistent arc starting and greater reliability compared to traditional HF arc starters,” notes Pieterse.

Adding to the TIG Runner’s reliability credentials is Wind Tunnel Technology™, which protects internal electrical and electronic components from the dust and fume routinely found on construction sites.

“Our 360° solutions are all about customer productivity and quality. The big issue on new-build plant projects and shutdowns in South Africa is weld repair rates and a good quality inverter along with a reliable gas supply system that can deliver accurate and consistent flowrates all add up to making it easier for welders to deliver the weld quality required and to raise productivity levels,” Pieterse concludes.

Afrox is currently partnering with a leading petrochemical plant service provider to introduce aspects of its 360° integrated TIG welding system for its next shutdown, and hopes to also be launching its MUPP 360° solution industry-wide early next year. ■



The Afrox development team for its 360° integrated TIG-welding solution for welding at heights, from left: Roberto Dionisio, R&D manager for Hardgoods; Arnold Meyer, welding engineer and applications development manager; and Johann Pieterse, business manager for the manufacturing industries.

The Afrox, 360° Integrated Customer Application Solutions programme, is an internally developed approach to doing business. “It always starts with a complex customer challenge followed by a partnership with the customer to develop a joint solution,” says Johann Pieterse, business manager for manufacturing industries.

“Once we have a good understanding of the challenges our customers face,



At the heart of Afrox’s 360° integrated TIG-welding solution for welding at heights is new multi-user pressure panel (MUPP), which enables up to eight TIG welders to work independently without the need for gas cylinders at the welding level.