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# NO PANE, NO GAIN

Windows and glazing panels have been getting heavier with the move towards triple glazing, larger windows and the greater use of structural glass in both commercial and residential buildings. This has been happening at the same time as manual handling rules have been getting stricter. The net result is that the old method of two or more people lifting a heavy window into place has gone on most job sites. This has led to a wider range and availability of glass handling equipment as more companies enter the market, leading to innovative new approaches. We take a look at some of the latest trends.

**The spider crane article on page 17 highlights the mini crane development and adoption by users in markets well beyond the original applications in stone and glass handling. We have seen how articulated/knuckle booms and hydraulic - or even electric - luffing jibs have enabled these cranes to take on jobs in construction and industrial installations that would have once required different techniques and equipment.**

For many glazing jobs - both internally and outdoors - spider cranes are an ideal tool to install panes or window modules particularly when equipped with vacuum attachments, searcher hooks and cantilever beams. On uneven, rough or hard to access sites, their outriggers can be vital. On high rise construction they can be equipped with long hoist ropes to lift or lower glazing panels into place

from the floors above, even allowing them to install windows several floors below the crane. Boom attachments also allow them to reach under soffits or over obstacles.

But these highly configurable well optimised machines - with their increasingly sophisticated control systems - are for many simple jobs an unjustified cost as well as being overcomplex for the work required, while also needing a well trained and experienced operator.

## A HANDY ROBOT PAL

Glazing robots offer a simpler and cheaper alternative to spider cranes. They share some characteristics but while spider cranes are designed for versatility, glazing robots focus on doing one task well, with simple controls and limited set-up requirements.



*GGR cantilever beam*



*GGR Sky Robot at work*

## GLASS HANDLING

While their approach to lifting is more like a crane than other load handling devices, their control systems owe much to forklifts, with a handlebar mounted to the rear of the machine. Similarly, with no outriggers and a basic three wheel chassis - two wide spaced wheels at the front and a single wheel or tightly paired twin steering wheel providing traction and direction at the back - they are not really suited to rough or uneven ground.

They also have a different boom geometry to a crane. On a larger spider crane or on a small mobile crane, several attachments such as cantilever beams or vacuum pads often need to hang from the hook. This will then need a searcher or negatively offsettable luffing jib to reach under soffits or into constricted spaces.

On most glazing robots, the glass manipulator itself is offset from the boom. The top of the pane will typically be above the head of the boom, allowing it to be positioned easily under obstructions.

This all combines, in most instances, to deliver a machine that can be offered on bare rental or owned by the end user with only basic familiarisation needed for operation. While they have their design origins in the needs of the glazing industry, they can, in many cases be used with different vacuum cups installed for other materials such as metal or stone façade panels.

### **MORE MOVEMENTS, MORE CONTROL**

Denmark's GMV has been building specialist load handling devices for 30 years, including Winlet glazing robots and ErgoMover electric trolleys, often used for plasterboard.

Earlier this year the company launched the Winlet 400. One of the key selling points for the Danish manufacturer is its fully hydraulic system. On earlier machines, the manipulator at the front of the robot had been able to move loads from side to side using a mechanical actuator. On the new 400, this movement can now be powered by hydraulic cylinders, offering a more compact and



*The new Winlet 400*



powerful machine overall, but at the cost of a little reach and height.

This evolution extends to the robot's controls. On previous machines, operators would need to use a switch to select which cylinder they wished to operate and then use the joystick to operate it with fully proportional speed control. This allowed for very precise movement on a single axis. GMV's new MAC Multi Axis Controller allows multiple hydraulic functions to be controlled at the same time. The operator selects one of three function speeds - 10, 50, or 100 percent - and can then move multiple cylinders simultaneously with the push buttons. This, for example, enables an operator to quickly raise a panel and rotate it into the approximate position at full speed, before switching to a much slower speed - perhaps 10 percent of the maximum - for the final few centimetres of movement, manipulating it with great precision.

Machines like the Winlet 400 are highly configurable. As well as choosing between the MAC and PSAC - Proportional Single Axis Controller - controls and mechanical or hydraulic vertical movements on the manipulator, buyers have a choice of two booms, tyres and wheels depending on their typical applications. The Winlet 400 can be fitted with an SHB two section

telescopic boom, or three section DHB boom. The former has a slightly shorter overall length, while the latter offers a greater lift height and more horizontal reach.

The Winlet 400, like other models in the range, also offers options on the wheels. The CL, or Compact Lifter version offers narrower wheels and tyres ideal for indoor use and operation in tight spaces, while the TL is equipped with wider wheels/tyres for better performance outdoors but naturally is wider, which can be an issue with narrow doors, but helps improve stability on uneven ground.





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*Dingli glass handler*



*The Dingli BT2615ERTGS can handle 800kg at just over 26 metres*

vacuum lifter head features eight independent suction cups running on a dual circuit system allowing operators to lift loads of different sizes with ease.

**A HUGE PANE**

Most glazing robots have fairly low capacities, usually a few hundred kilogrammes, with relatively low lifting heights often in the range of three or four metres. But at the top of the segment there are a few machines that can carry bigger loads and reach much higher.

The best example of this is GGR's new Sky Robot 1500, which in other markets is known as the Dingli BT2615ERTGS, based on the manufacturer's 80ft all-electric telescopic boom lift. Glass handling specialist GGR spotted the potential of the product when it was first announced and purchased the first machine in Europe. Having tested the unit it decided to sell and rent its own branded version of the machine. Given its height and capacity it has decided to rent it out as an 'operated machine' rather than bare rental. The maximum capacity is 1.5 tonnes, which it can take to almost 22 metres, while handling 800kg at just over 26 metres.

The new machine could be a game changer for some types of work, whether indoors or outside. It employs a large lithium-ion battery pack, allowing it to work without emissions or noise for a full day, while its large rough terrain tyres allow the machine to work at grades of up to three degrees. As on the platform, non-marking tyres are standard.

GGR says that one of the machine's stand out features is the fully articulating 3D head that can rotate 360 degrees, tilt 90 degrees up and 30

degrees down and, at certain points in the load chart/working envelope, slew 80 degrees left and right. With a 200mm vertical and horizontal side shift function, it allows millimetre precise installation. The extendable arms of the built-in

**LET'S GLAZE BRANDON**

US based Bailey Cranes makes a wide range of special mini cranes and lifting machines which are rarely seen or promoted in Europe. In its home



*The Brandon is available in several versions*

*Dingli glass handling head*






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## GLASS HANDLING

market the company is a significant player in the specialist handling segment offering clever solutions such as ATEX explosion proof aerial work platforms, carry deck cranes and their Brandon telescopic handlers which form the basis of its glass handling range.

The Brandon is available in a number of distinct versions. The original machine has front axle drive and a single steered wheel at the rear with caster outriggers for extra stability. The Brandon G, Junior and Brandon Mini take the same approach to steering and traction wheels as the Winlet glass robots, with single wheel rear drive and steer. The Trax, as the name suggest, is a mounted on rubber tracks, and the Brandon Omni offers sophisticated steering options, manoeuvring sideways or rotating around its centre.

The latest addition to the line up is the Brandon Electric, which was launched last year as a mini crane with double the battery life available than on its previous models designed for a wide range



*Bailey Solar Trax*



*Brandon trax*

of applications. It can be used with standard vacuum pads as a glass lifter and can also handle metals, granite, quartz and concrete building panels with alternative pads and attachments. It can also carry an aerial work basket. It offers a 7.3 metre lift height with up to 4.8 metres of horizontal reach and has a boom hook capacity of 2.7 tonnes, can carry 1,100kg on forks or lift

1,360kg with a winch. For glass handling, with a Wood's Powr-Grip vacuum attachment, it can lift 500kg.

Bailey has recently developed a couple of clever tools for specialised applications. One of these is The Flipper, which is designed to place or pick up glass panels lying flat on a table or workbench, and then flip them 180 degrees over the front of the



## TELESCOPIC AND ARTICULATED SPIDER LIFTS FROM 13 TO 52 METRES

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*The Flipper*

boom. This could be used in a factory setting, for example, to allow for both sides of a panel to be worked on or inspected. On site, it could allow for a piece like a skylight to be assembled flat, picked up, flipped and installed in the roof above. It also has side shifting axles, allowing for precise horizontal placing.

**MORE SOLAR POWER, LESS MANPOWER**

Another tool with a much more specific application, but potentially huge levels of global demand, is the Solar Trax 824. Rather than just lifting glazing panels, the Solar Trax is designed to transport and install panels on solar farms. The device is based on the crawler mounted Brandon Trax glass lifter, but fitted with a 2.4 metre vertically telescoping boom carrying a seven metre traverse beam, with a trolley that raises and lowers a horizontal panel frame. The Solar Trax upper structure is designed for use on more extreme terrain than the standard Brandon Trax.

Bailey demonstrates the machine with a three-person crew, tethered to a Pallet Management Vehicle or PMV. Bailey says that this is a 'transition step', allowing current methods, where pallets of 30 panels are distributed around a solar farm at 17 metre intervals. The PMV is self-propelled and has 1,360kg capacity forks which can be used to pick and carry the pallets. It has a flat body, which fits neatly below the Solar Trax lifting frame.



One crew member operates the machine using a remote control, the other two stand on either side of the PMV and manually handle the panels one at a time. They raise the panel from their leaning position on the pallet and turn them to lay flat in pairs on the lifting frame. The vertical boom raises the traverse beam and the lifting frame. The operator then moves the trolley to either end of the beam, and the trolley lowers it into place.

It's a clever solution, which Bailey says is already being used in the field. But it will become even more efficient when the PMV and pallets are replaced by autonomous delivery vehicles which can bring panels directly to the machines and reduce the requirement for manual handling.

US trade association SEIA (Solar Energies Industry Association) believes the combination of clever, cost saving technology, government support and the requirements of a transition from fossil fuels promise explosive growth for the sector which has already experienced a compound annual growth rate of 33 percent over the past 21 years. In 2021, SEIA says that 46 percent of all new electrical capacity added to the US grid came from solar. By the end of the decade, annual levels of solar installations will need to rise from the 25GW installed in 2021 to 130GW a year. ■



*Bailey PMV solar cart*



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