

**Special print: Krone BiG Pack 1290 HDP II**

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# Under pressure

Presented by:

  
THE POWER OF GREEN

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**Summiteer:** Summitier – with the same size bale chamber, baler throughput has increased by 100 percent since 2003.

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# Under pressure

Straw trading has developed into a fiercely competitive business in which customers make great demands on the equipment they use. These are the customers the Krone HDP II was designed for. This baler stirs up enthusiasm among even the most seasoned operators and tests the most powerful tractors to the limit.

By Karsten Schranz

90/60/90 is so yesterday. The new dream measurements are 2.40/1.20/0.90, with a body weight of just 500kg. No, we're not talking the latest trends in model casting shows here – but the Krone BiG Pack 1290 HDP II. This baler produces bales with these dream measurements, churning out up to 149 in one hour. To achieve this, the machine is packed with plenty of complex technology and still performs without any hiccups in the field. In summer 2014 we got the chance to see this performance for ourselves in a field test. And we discovered that not even a defective knotter fan could stop it. But more on this later. For the time being, let's start up front, i.e. at the pick-up.

## EASYFLOW RAKING IT IN

Up front, it's all about straw intake, of course. And the unit in charge of that on the 1290 HDP II is the new 'Active pick-up'. It has no cam but a powered crop feed roller which actually enhances straw intake. In fact, the straw intake was flawless as we put the machine through

## Technical data

**Pick-up:** EasyFlow Active, 2.3 m wide, five rows of tines, 55 mm tine spacing, actively powered crop feed roller, standard feed augers on both sides, standard-fit crop press roller and depth limiter, pivoting gauge wheels

**Cutting system:** X-Cut, 26 knives in two drawers, rotor with Hardox plated tines; hydraulic knife bank, selectable 0-13-13-26 sets of knives, individual knife protection

**Bale chamber:** Variable filling system (VFS), 3 packer rakes, 1 feeder rake, 1 retainer, electronic bale length measurement, 600 kg flywheel, hydraulic start assist system, exclusively drive-shaft powered components

**Dimensions and weights:** 1.2 m x 0.9 m chamber, 1 m - 3.2 m long bales; 2.9 m high; 9.05 m long (transport); 3.7 m high; 14-15.8 t weight; 8 double knotters, max. 54 balls of twine, 45 strokes/min (36 at 800 rpm).

**Price (excl. VAT):** from €260,740

its paces. The pick-up has its tines spaced at 55 mm and arranged in five rows across a 2.35 m width. Assisted by the two feed augers on the sides, the powered feed roller feeds the material consistently into the baling chamber. The 'Active pick-up' has a standard crop press roller which prevents large swaths from a 12 m combine being pushed up when work rates are high. The entire assembly has standard depth control and offers easy tension spring adjustment of the ground pressures applied by the crop press roller and the pick-up. Height control for the crop press comes from two chains that allow adjustment without tools. On the whole, the pick-up runs very quietly, even when gathering thick swaths, and especially at high work rates.

## CUTTING-EDGE: KRONE X-CUT

The Krone X-Cut cutting rotor delivers good quality forage, using knives to cut the material to a nominal length of 44 mm. This X-Cut offers contractors the flexibility to respond quickly to customer needs, courtesy of the knife operation system which allows either all or just half the knives to be used at any one time. When

PHOTOS: MUMME/SCHRANZ



only half the knives are in action, they cut the crop to lengths of 88 mm; when no knives are selected, the machine obviously doesn't cut at all. The feed tines are arranged in a V and are Hardox plated for a long service life.

The knives are housed in split knife drawers which lower hydraulically and then pull out to either side for replacement or removal. All knives are individually protected by springs, because a machine that operates at

high work rates and close to the ground is always at risk of picking up foreign objects. So when the load on any of the knives exceeds a certain level, the knife is released and retracted and returns into work position when the obstacle has passed.

The pick-up and the rotor cutter are powered by a poly V-belt which stops instantly when there is a blockage. And finally, the rotor is 30% bigger than on the predecessor model.

## VARIABLE CROP FEED

A major factor in producing the high-density bales so typical of the HDP II is the variable filling system (VFS). This combines the advantages of constant crop feed and portioned feed so swath size and shape are less important. The VFS operates in four stages. Three packer rakes compress the material inside the feed chamber before it enters the baling chamber. During this pre-compressing phase, the retai-



**1** The crop press roller is a standard component. **2** The EasyFlow pick-up operates at a 30% higher speed and yet runs quietly. **3** Each test bale weighed almost 500 kg. **4** Tipping the scales at more than 15 t, the HDP II is anything but a lightweight machine. **5** Instead of chains, drive shafts and gearboxes power the assemblies on the HDP II. **6** The flywheel weighs more than 600 kg.



ner has not yet cleared the passage into the baling chamber. Once the feed chamber has been filled to capacity, the retainer swings in, clearing the passage into the baling chamber. At the same time, a clutch is released, which in turn alters the action of the feeder rake. This stops compressing the straw inside the feed chamber and starts feeding the material into the baling chamber. Once all the pre-compressed material has entered the baling chamber, all the rakes and the retainer return to their starting positions.

This kicks off the actual baling cycle. And this is intense. The pressing force applied by the plunger is constantly monitored with the help of two sensors whose readings are aligned with the target pressures on an ongoing basis. If the actual and target pressures differ too much, the system will correct the plunger force by adjusting the top and side doors of

the baling chamber, which are controlled by a total of six hydraulic cylinders. These are supplied with oil through a separate circuit and from a separate on-board 15-litre oil tank, which is positioned above the flywheel. The baling force control system is supplied with oil by a pump driven by the main gearbox.

### IN GOOD SHAPE

In light of the HDP II's high output and throughput, you'd hardly expect all the bales to come out looking identical. And yet they do – courtesy of the new pressure spring loaded retainers. Located on the sides and ceiling of the baling chamber, these keep the wads most recently delivered to the chamber in shape and guarantee uniform chamber fills every time. Bale length is measured and maintained by a star wheel which constantly compares the actual measurement with the set target length. Once

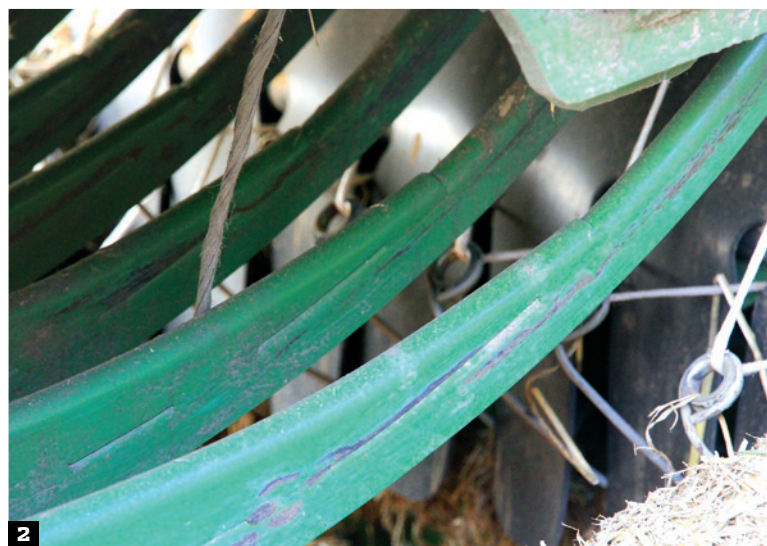
the bale is finished, the operator can either eject just the finished bale waiting at the end of the chute or empty the entire bale chamber after refitting a pin.

### IN BALANCE

To kick off the baling cycle, the massive flywheel needs to get moving. There is more than 600 kg of flywheel mass built into the HDP II. To get all components off to a smooth start, the HDP II is equipped with a standard hydraulic starting aid which accelerates the flywheel to 300 rpm before the tractor's PTO is actually started – a solution that reduces the load on all components. The intermediate gearbox which sits on the drawbar is positioned in such a way that the drive shaft is level. It transforms the baler's speed to 1,180 rpm, provided the tractor has a 1,000 rpm PTO. But crop conditions permitting, the baler can



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**1** The twine boxes are lowered hydraulically for easy filling and maintenance. **2** The machine can store enough twine to tie up to 800 bales. **3** The optional knotted fan keeps the twine feed system clear of chaff. **4** The eight double knotters are cleaned by blasts of air from an on-board optional compressor which operates independently of the tractor's air brake system.



## TRADING STRAW THROUGHOUT EUROPE

The Dutch Verschoor group has a long track record in the straw trading industry. It also trades in organic fertilisers and fungi substrates. The group handles the entire straw and hay harvesting chain that follows the combine harvester – baling, collecting, storing and hauling the bales throughout Europe. Operating in Germany since the mid-1990s, Verschoor also runs a pelleting and chopping mill in the German town of Oschersleben.

Here, Arjo van Zee coordinates the harvest and haulage fleets which count up to 17 balers in the peak season. „We exclusively use Krone balers,“ explains the Dutch coordinator, who has contracts with more than 100 farmers in the region. „Depending on yields, we collect at least 60,000 to 80,000 bales of straw from 8,000 hectares of land every season. This means our top priority is finishing the job on time if we want to get another contract next year.“ The key to success here is using powerful and extremely dependable equipment.

„We constantly strive to optimise the entire harvest chain. This includes making the most efficient use of the available storage space and the haulage fleet. So we have no choice but to pack more material into each bale,“ Arjo van Zee explains. „Krone has always welcomed our suggestions, and still does. Naturally, just like any other new development the BiG Pack HDP II had its teething problems, but the Krone Service department has never let us down! Today, the machines have no real weak spots. They run absolutely dependably and at a much higher throughput.“ The HDP II generation has doubled its throughput over that of the previous generation, he adds. „The Krone balers and the Krone Service are the foundation of our business success.“



also be powered at just 800rpm to save fuel. At 1,000rpm the system heaps 45 strokes onto the plunger every minute, whereas at a lower speed the number of strokes is reduced to 36.

Although Krone has systematically replaced all chains and shear pins with direct drivelines, for example drive shafts and gearboxes, the BiG Pack HDP II runs extremely quietly without bouncing. The models with a cutting system differ from the models with packers in one detail in terms of the driveline: the balers with a cutting system use a belt to engage the rotor and the pick-up separately. Whereas on the packer machines the rotor and the pick-up are driven by a drive shaft which sends the power from the main gearbox to the pick-up (the gearbox can handle 1,680hp!). The advantage of using a belt driveline is that it delays the rotor cutter's start-off slightly at machine start, minimising the power input necessary to start

up the machine. Because the packer machines have no heavy rotor cutter, all components and assemblies can start off simultaneously, making this feature redundant.

### EIGHT IN A ROW

The knotters, too, play a key role in the baling action. The BiG Pack HDP II uses a system of

During bale formation, one of the strings knotted at the beginning of the bale formation cycle is fed by a tensioning system along the bale's underside to its rear end. From here the string runs up to the top where it is knotted with the string running along the top of the bale. Admittedly, this is a complex system, but it does offer a number of benefits. The thread

*“The hydraulic start assist system which comes as standard gets the 600 kg flywheel moving. The hunt for straw is on.”*

eight knotters, a number that's needed to hold those high-density bales securely together. Krone has patented this system. Unlike a single knotter, a double knotter always feeds a lower and an upper twine. These two strings are tied into a knot at the beginning and end of each baling cycle.

is not held by the knotter or pulled around the bale, which can place great strain on it. This is a great benefit that has proved its worth in the field, particularly with high baling pressures. The airlines also play a part in this. There is one line for each individual knotter which blasts it with air to clear any chaff and debris. This air is



sourced from the tractor. An optional cleaning fan keeps the area ahead of the knotters free of debris. This fan failed temporarily during the field test, however. When we halted the combination we noticed that dirt and chaff had collected in front of the knotters and only the pneumatic cleaning system was still working. And yet not a single knot was mistied. Despite poor cleaning the knotters performed dependably – at speeds of just under 20 km/h.

### BOXING CLEVER

Another highlight of the HDP II are the twine boxes which lower hydraulically as standard, a feature that not only makes refilling but also servicing and cleaning much easier. The boxes have storage capacity for 54 balls of twine. As an option you can add another pair

of boxes to the chute, making room for either another twelve balls or ten balls plus a toolbox. This brings the capacity to a massive 66 balls – enough to tie more than 1,600 bales,

rols functions such as locking the steered axle automatically. If you're after more, you can order the popular CCI terminal, which offers the full ISOBUS functionality. It also delivers

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***“The twine boxes on the new HDP II hold 64 balls, or even 66 if you don't take a toolbox along.”***

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and more than enough to keep up with the HDP II's ultra-high throughput!

### TUNED INTO ISOBUS

The control units are all ISOBUS compatible. The entry model is the Delta terminal, a Krone unit with a colour display touch screen. Depending on the tractor, this head unit cont-

easier digital data management: for example, it memorises and transmits all job billing data and navigates to the field.

The top-spec model stores all kinds of bale data – weight, moisture and bale position in the field – and transmits it wirelessly to the office computer for billing. Krone markets these contractor features under the ICAN label.



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- 1 The bale chute can be ordered with an optional weighing system (€ 4,280).
- 2 The chute up/down controls at the rear are operated from the ground.
- 3 The bale length is set on the terminal and controlled electronically.
- 4 The weighing elements are installed on the chute.
- 5 The drive shaft runs straight to the drawbar-mounted gearbox.
- 6 Our test machine was controlled from the CCI terminal.

## GROWN INTO A STURDY MACHINE

It goes without saying that the baler must be able to cope with and withstand these immense outputs and throughputs throughout its entire service life. With the HDP II's predecessor, the BiG Pack HDP HighSpeed, weighing in at up to 12.6 t, the current HDP II tips the scales at more than 14 t with the same specs. After all, the baling chamber had to be upgraded to withstand those powerful plunger strokes and cope with the constant flow of material. Besides, the two extra knotters and the higher twine storage capacity

all add to the overall weight. So Krone also offers machine buyers a choice of different tyres. They can choose from three section widths: 560, 620 and 710 mm. But with the largest size 710/50 R 26.5 rubber, the HDP II will be 3.19 m wide, so it will need a special permit for travelling on public roads. The 620 mm tyres won't take the machine over the 3 m transport width.

The work that Krone has put into developing this beast is phenomenal. But it has paid off: The HDP II accomplishes the straw pro's goal of highest density bales beautifully.



## The bottom line

The Krone BiG Pack I290 HDP II is an absolutely professional machine that is clearly designed for contractors who work in all aspects of straw handling – collection, storage and haulage – and who keep a keen eye on costs. The throughput is impressive.

It's achieved using complex technology that comprises eight double knotters and the VFS variable filling system, which compresses the straw before it enters the baling chamber. But despite the complex engineering, the HDP II doesn't behave like an uptight diva. On the contrary, in fact. In our test it went on delivering 100 percent dependability despite the fact that the cleaning fan was not working properly and without the operator adjusting the work rate. Details like the standard-fit hydraulic start assist system reduce component wear. The twine boxes lower hydraulically as standard, making them easier to refill and maintain.

The base price of € 260,740 excl. VAT also marks the baler out as a piece of professional kit. Weighing in at 15.8 tonnes, the enormous machine leaves 400 hp tractors struggling even in flatland when working at high rates and throughputs. After all, to get a lot out you also have to put a lot in.

- + Extremely high throughput
- + high, uniform bale density throughout
- + comprehensive ICAN management features
- + direct drivelines result in smooth running
- expensive
- heavier and bigger, so less flexible

# The Power of Green

## KRONE BiG Pack HDP II

- Innovative technology for maximum outputs
- HDP II technology for up to 70 % higher throughputs at uncompromised bale densities
- 8 double knotters warrant best bale shapes
- Rock-hard bales although work rates are high
- KRONE X-Cut for perfect cutting quality



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