

MOUNTED REVERSIBLE PLOUGHS
EUROPAL
AND
VARIOPAL





**Reliability, ease of use
and superior work quality**



The expansion of maize cultivation in recent years, in particular, has restored the plough to its position of importance. Even today, a sustainable alternative to the plough has yet to be found for the prevention of crop diseases, for mechanical control of weeds that have acquired resistance to herbicides, and for the control of mice and other pests.



Recent studies have, for example, shown that by its use for breaking up and aerating the main root zone, the plough is the ideal solution for the optimum development of the rape-seed root and therefore a sound basis for high and reliable yields.

LEMKEN EurOpal and VariOpal ploughs combine reliability in service and user convenience with outstanding quality of work.

With their comprehensive equipment and wide range of accessories, they enable every farmer and contractor to select the ideal machine for their own tillage tasks. These include numerous options for interbody and underframe clearance, versions for stepped and infinitely variable adjustment of the working width, and mechanical or hydraulic overload safety systems.

The following equipment types are available:

- All EurOpal and VariOpal ploughs are available with an interbody clearance of 90 or 100 cm; for the 9 range there is also an interbody clearance of 120 cm.
- In the standard version of the EurOpal, four different working widths can be selected.

- The VariOpal model range features hydraulic working width adjustment as standard. A double-action hydraulic cylinder enables all working widths from 22 to 60 cm to be set for each body from the tractor seat. An ideal solution is therefore available, whatever the tillage requirements.

- Both EurOpal and VariOpal feature a shear-bolt system as standard equipment. For stony ground, they can be equipped with the mechanical Tandem or hydraulic HydriX auto-reset systems.



Optiquick: for perfect ploughing



The ideal setting, for time and cost savings

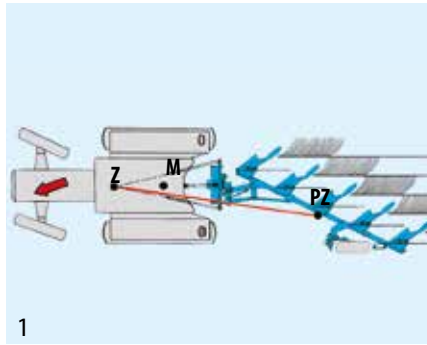
Precise plough adjustment is crucial if material wear and fuel consumption are to be kept to a minimum. For this reason, LEMKEN has developed Optiquick, its unsurpassed adjustment system, which is also used by EurOpal.

Optiquick enables the front furrow width and tractor-plough alignment to be adjusted quickly and easily, thereby saving time and reducing costs.

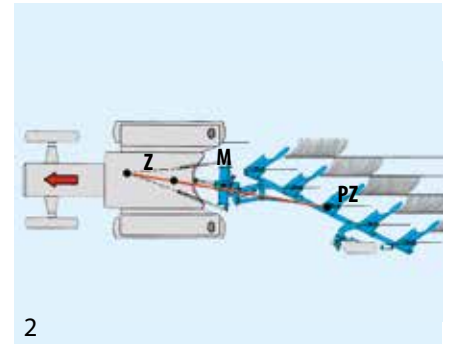


Optiquick adjustment centre

The LEMKEN Optiquick adjustment system assures ploughing with unparalleled ease. In the interests of high stability and long service life, the pivot points have wear-resistant bushes and hardened bolts, and can be lubricated.



1



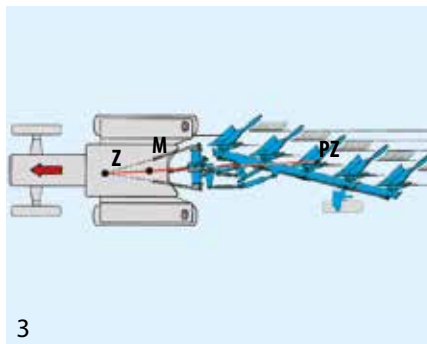
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EurOpal: front furrow width and pull point adjustment

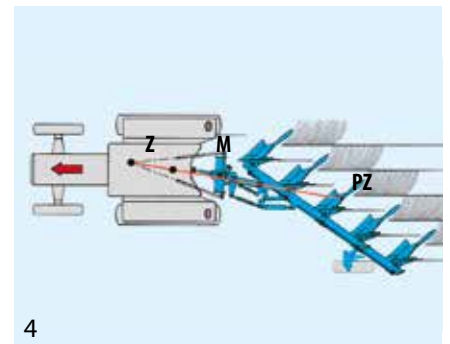
- The ideal plough setup is for the tractor-plough alignment line (in figure 2, the line between Z and PZ) to pass through the centre of the rear tractor axle (M). Z marks the pull point at which the theoretically extended bottom links intersect. PZ marks the centre of the plough.
- The front furrow width is first set. The outer turnbuckle is used for this purpose. The tractor-plough alignment

is not yet ideal (Fig. 1), since the line between Z and PZ does not pass through the centre of the rear axle, resulting in side draught during ploughing.

- The inner turnbuckle is then used to correct the side draught. The tractor-plough alignment now intersects the rear axle of the tractor at the point M (Fig. 2). Despite the correction of the pull point, the width of the front furrow does not change.



3



4

VariOpal: ploughing without side draught, at any working width

With the VariOpal, too, the front furrow width and pull point can be adjusted independently of each other.

- With Optiquick and Vari technology, VariOpal ploughs are always easily drawn and free of side draught,

whether with a narrow (Fig. 3) or wide (Fig. 4) working width.

- Vari technology ensures that the front furrow width is adjusted automatically whenever the working width is changed.



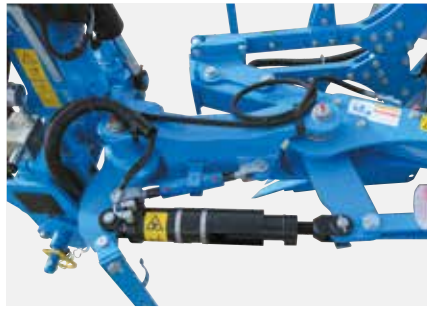
Perfectly engineered – superior work quality



The perfect turnover mechanism

All LEMKEN mounted ploughs feature the proven UNITURN hydraulic turnover mechanism with double-acting reversing cylinder and integrated automatic plough-angle lock.

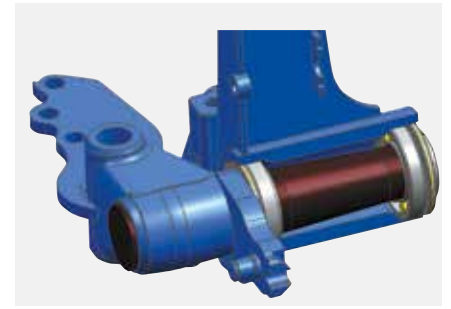
- This mechanism assures that turnover is quick and precise, and dispenses with the need for readjustment of the plough angle during ploughing even should leakage or pressure loss occur in the tractor hydraulics.



Swing-in frame

On tractors with low lift height in particular, the hydraulic swing-in of the frame is recommended on Euro-ploughs from four furrows upwards, and is necessary from five furrows upwards.

- Swing-in considerably increases the clearance between the depth wheel and the ground during turnover.
- The finely tuned interaction between frame swing-in and turnover cylinder assures precise and safe turnover.



Turnover shaft and pivot mounting

The short, strong turnover shaft is able to withstand hard shocks and sustained loading.

- Its geometry has been designed for strength. It runs in taper roller bearings and is lubricated centrally.
- The selected heat-treated steels from which the pivot mounting is manufactured lend it high stability and resistance to wear, and assure a long service life.
- Packing on both sides protects the bearings against fouling.



Height adjustable cross shaft

The height-adjustable cross shaft can be adjusted for all conditions, permitting the optimum position for the bottom links of the tractor at all times.

- The cross shaft can be exchanged quickly and easily to match other link categories. The arrangement benefits both the tractor and the implement, since the sprung cross shaft has the effect of absorbing shocks.



Separate plough angle adjustment

The plough angle on each plough side can be adjusted separately by means of cap nuts.

- The cap nuts are easy to use and at the same time prevent the ingress of dirt into the threads.
- Adjusting the plough angle therefore remains easy.



Toolboxes in the headstock

LEMKEN ploughs are easy to service. Tools, shear bolts and other sundry items are kept ready to hand in toolboxes.

VariOpal for wide or narrow furrows

Good ploughing depends to a large degree upon the working width and working depth of the individual plough bodies. The LEMKEN VariOpal enables the demands of tillage upon ploughing to be met to the full.

In order for the desired result to be achieved according to soil type, moisture content, and whether seed or winter furrows are to be ploughed, the working width of the VariOpal can be adjusted simply and steplessly during ploughing itself. Other tools such as skimmers and disc coulters adjust automatically when the working width is changed, as does the depth wheel.

The narrow furrow is more friable, providing ideal conditions for simple seedbed preparation with a small number of subsequent tillage steps.

The wide winter furrow generates a cloddy surface, permitting good frost tilth.

The VariOpal simplifies the ploughing of wedge-shaped areas, straightening of curved areas, and ploughing around poles or trees. The tractor performance is also exploited to the full.

The VariOpal is equipped as standard with hydraulic working width adjustment. A double-action hydraulic cylinder enables all working widths from 22 to 60 cm to be set for each body from the tractor seat.



Ease of adjustment

VariOpal adjustment systems

Hydraulic working width adjustment

Infinitely variable adjustment of the working width by means of a double-action hydraulic cylinder (1) is a standard feature.



Memory cylinder

The memory cylinder (2) is recommended for the ploughing of four or more furrows. Besides hydraulic adjustment of the working width, it offers an additional function: during turnover, the plough frame is swung inwards to provide the necessary ground clearance at the depth wheel. The memory cylinder ensures that the working width is automatically reset to the width set before turnover.



An easily readable scale (3) displays the selected working width to the tractor driver.



Rigid frame construction satisfies all requirements



Box-section frame

The strong, thick-walled box-section tube manufactured from micro-alloyed fine-grained steel provides a sound basis for the frame structure.

- The frame is designed to be fitted with one additional furrow if required.
- It combines low weight with long service life.



Adjustable leg brackets

The bolted joint between the adjustable leg brackets and the frame assures high stability, reliable long-term strength and a close fit.

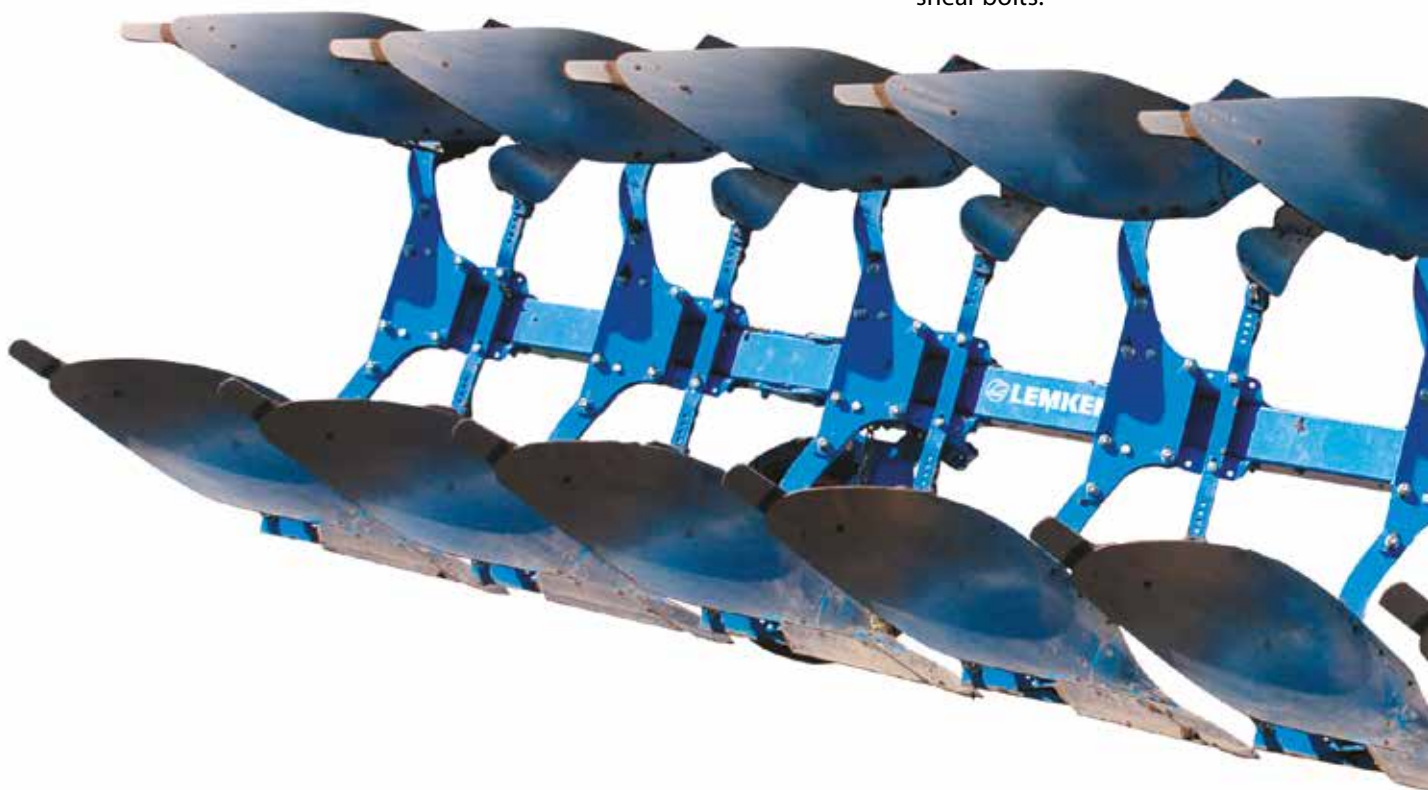
- Following loosening of the central bolt, four different working widths from 30 to 60 cm can be selected.
- Skimmers and disc coulters adjust automatically.



Interbody clearance

Together, the large interbody clearance, the location of the plough bodies on the side of the frame and the geometry of the plough legs result in generous clearances both between the plough bodies themselves and between the bodies and the skimmers.

- Blockages are avoided even with narrow working width settings.
- The plough legs feature double-cut shear bolts.

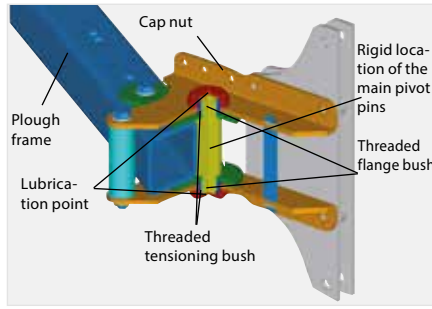




Pivot points

The pivot bracket is located to the side of the frame with its pivot point close to the plough body.

- The result: reduced stress upon the bearings and associated components.
- All pivot points feature wear-resistant bushes, hardened pins and lubrication points.



Variable pivot brackets

The main pivot pin of the pivot bracket is fitted with tensioning bushes and is fixed to the frame plates such as to be torsionally rigid.

- The pivot bracket is also fitted with tight-locking flange bushes. The two bushes for the furrow width adjustment, running one within the other, guarantee long service life.
- Each component can be replaced separately when worn.



Frame plates

The frame plates for mounting of the pivot brackets and main link are bolted to the frame.

- This arrangement assures immense strength, high durability and a perfect fit.



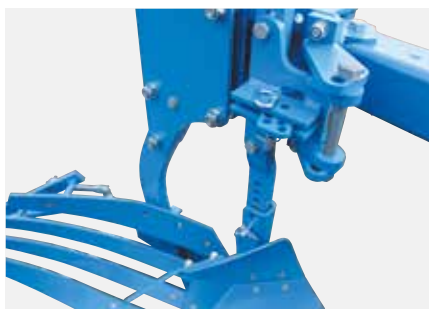
Ready for tough conditions



Flat leg

Mounting the skimmer on a flat leg prevents it from rotating.

- All share and mouldboard types can be interchanged, since the frog is the same for all skimmers.
- The frog can be removed quickly for ploughing without skimmer by the release of just two screws.



Working angle adjustment

A shear bolt device with quick adjustment of the working angle of the individual bodies is available as an option for the skimmer on EurOpal and VariOpal ploughs.

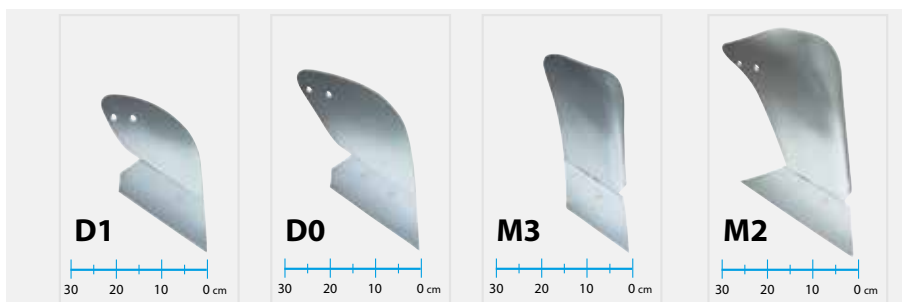
- This enables the trash to be directed with high precision.



Working depth adjustment

The skimmers on EurOpal and VariOpal ploughs with automatic overload safety systems can be moved along the beams.

- Here too, pins are used for adjustment of the working depth, obviating the need for tools.
- If adjustability of the working angle is desired, a round crank leg with screw fitting is available.

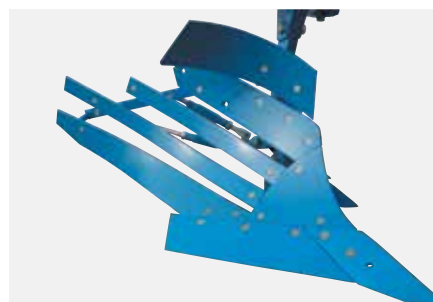


Skimmers

The skimmers are available with a range of share lengths and ensure blockage-free ploughing even under difficult conditions.

- The special share geometry reduces wear to a minimum and extends service life. Its mode of action optimizes the soil flow.

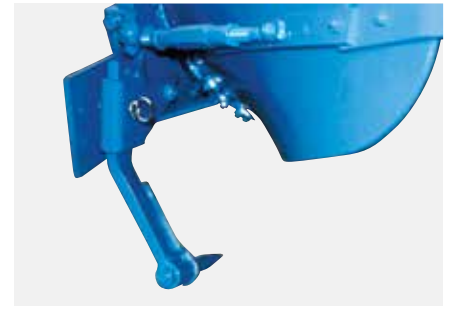
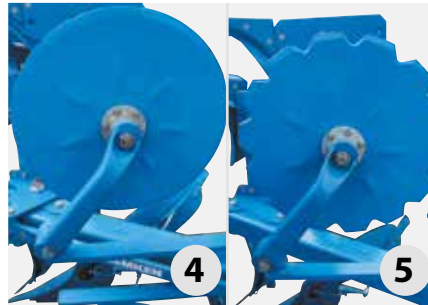
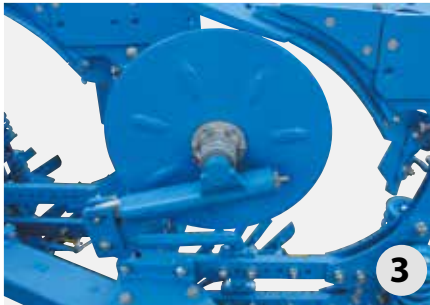
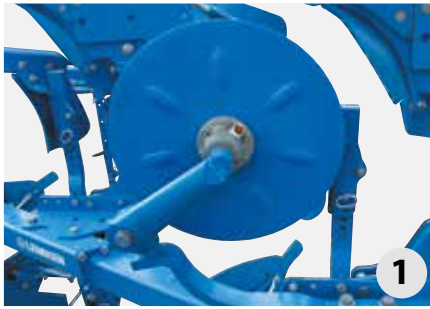
- The special form of the mouldboard divides up the trash and incorporates it cleanly.
- For sticky soils and those which generate little pressure upon the skimmer, a plastic mouldboard is available.



Trash boards

The trash boards are fitted directly on the plough leg, and offer a range of adjustments.

- They ensure blockage-free ploughing and clean incorporation of trash.
- For sticky soils, plastic trash boards are also available.



Subsoiler

The special geometry of the subsoiler is particularly effective in loosening the soil.

- It can be adjusted for depth without the need for tools, and can be removed easily if necessary.
- All wearing parts can be replaced separately. The shank guard protects the shank against wear.

Disc couler

The side of the plain disc couler is beaded. The beading keeps the disc rotating even under heavy trash conditions.

- The depth is adjusted by vertical swivelling of the couler arms which can be locked by means of a screw in a toothed arrangement.
- The plain bearing, located on the land side, is double-sealed against dirt ingress.

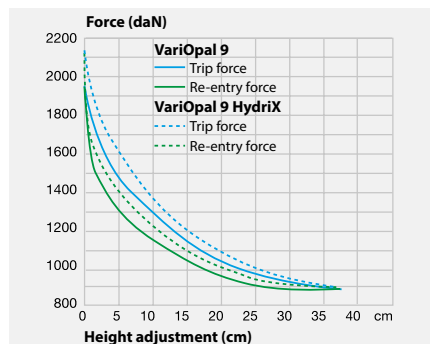
- Several versions and mounting locations of disc couler are available:
 - Ø 500 mm, adjacent to the skimmer (1)
 - Ø 500 mm, ahead of the skimmer (2)
 - Ø 450/500 mm, sprung (3)
 - Ø 590 mm, adjacent to the skimmer (4)
 - All diameters are available notched if preferred (5)



Overload safety systems for LEMKEN ploughs

All LEMKEN overload safety systems provide protection against damage should the share point encounter an obstacle. Beside the double-cut shear bolt safety system fitted as standard, all LEMKEN auto-reset systems are based upon a deflection system. With its high trip and re-entry forces, this system assures gentle, shock-free tripping when the plough hits an obstacle. The stress on the tractor and the plough is reduced as a result.

In the Tandem mechanical auto-reset system, the beam and leg, manufactured from resilient spring steel, are



Force characteristic on the share point

Gentle, shock-free tripping with double-coil springs or hydraulic cylinders. The deflection system ensures that the force decreases slowly following tripping and increases slowly again during re-entry.

- High trip and re-entry forces permit firm guidance of the plough body and uninterrupted ploughing on stony soils.

able to deflect widely to the side. On the HydriX hydraulic overload system, the trip force can be adjusted between 50 and 140 bar. A low trip force can therefore be selected for work on light soils.

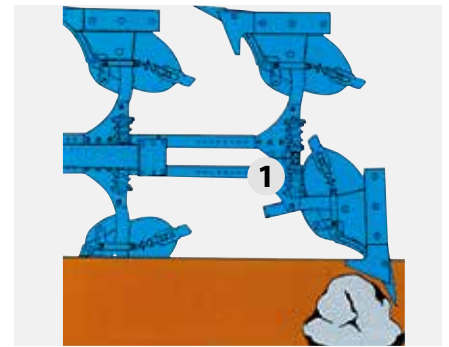
During work on heavy soils and under harder ground conditions, high trip forces ensure that the plough body remains firmly in the soil at all times.



Tandem overload safety system

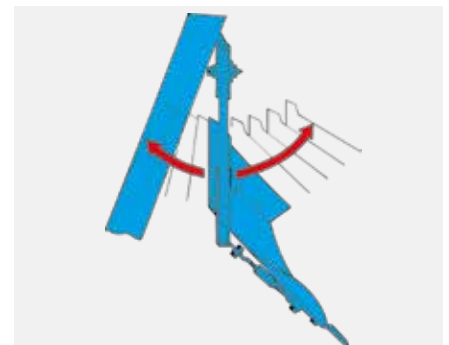
No significant frictional forces are generated on the spreader roller running between the Tandem beams, whether during tripping or re-entry.

- Force losses at re-entry of the plough body are therefore kept to a minimum.
- The result is a steady trip characteristic: gentle and shock-free tripping is followed by powerful and rapid re-entry of the plough body.



Shear bolt safety system

The shear bolt (1) provides additional protection should the system snag under rocks or roots.



Behaviour in response to obstacles

When the plough encounters an obstacle, the high-quality and resilient tempered spring-steel beams and plough legs are able to deflect side-ways to an unusual degree.

- At the same time, the beams are firmly guided and prevented from springing out of their mountings under any circumstances.
- Both the leg brackets and the beams and roller are bolted rather than welded, ensuring high strength of the overload safety elements and long service life.



HydriX hydraulic auto-reset system



Variable pressure adjustment

The facility to adjust the trip force easily is a particular benefit during ploughing of stony and frequently changing soil types.

The pressure in the hydraulic system can be adjusted easily to the particular conditions with the aid of HydriX, LEMKEN's hydraulic version.

- On light soils, the lowest possible trip force is selected in order to keep any stones in the soil.
- When the conditions become tougher, the tractor driver uses the control unit to increase the pressure such that the plough bodies remain firmly in the ground.



Adjustment range and maintenance

The pressure can be adjusted between 50 and 140 bar by means of a handwheel on the control block.

- Custom limits can be set on the plough control block and activated through the controls on the tractor.
- Readjustments with reference to the manometer are not necessary.
- The rigid connection between beam and frame enables the HydriX auto-reset system to employ low system pressures.



The OF-Version



Ploughing onland and in the furrow

Onland ploughing with the EurOpal OF / VariOpal OF is particularly protective of soil structure in that there is no compaction risk from tractor wheels running in the plough furrow.

- Dual wheels can be applied, allowing consistent, soil-protecting power transfer. Side draught can be overcome with a well-ballasted tractor.
- Cross-slope downhill ploughing is also possible as is ploughing close to field or other physical borders with both on-land or in-furrow systems.
- Ploughing can also carry on in unfavourable conditions, e.g. on wet ground, with a change to the in-furrow mode.
- These ploughs allow rapid hydraulic adjustment from on-land to in-furrow mode, for instance for ploughing-in the last furrows.
- All the advantages offered by the Vari technology can be used with both on-land and in-furrow configuration.



Cost-efficient plough bodies



Dural body

The frog of the Dural body is hardened and tempered, and thus exceptionally strong.

- The angle of attack of the plough bodies can be adjusted and assures good entry into the soil at all times.
- The smooth transition from the share to the mouldboard and the low-resistance geometry make the plough even lighter to pull.
- The mouldboards are manufactured from a special hardened steel, and have a low-wear geometry with no bolts in the main wear zone.
- The extra-large mouldboard shin is a separate component and can thus be replaced at low cost.



Slatted body

The slats of the slatted body are manufactured from thick, through-hardened special steel, and can be replaced individually.

- The securing bolts are deeply countersunk, ensuring that the slats remain firmly fixed even after extremely long periods in service.
- Slatted bodies and normal mouldboards are based on the same frog.
- The shares are separate components and are manufactured from micro-alloyed boron steel.

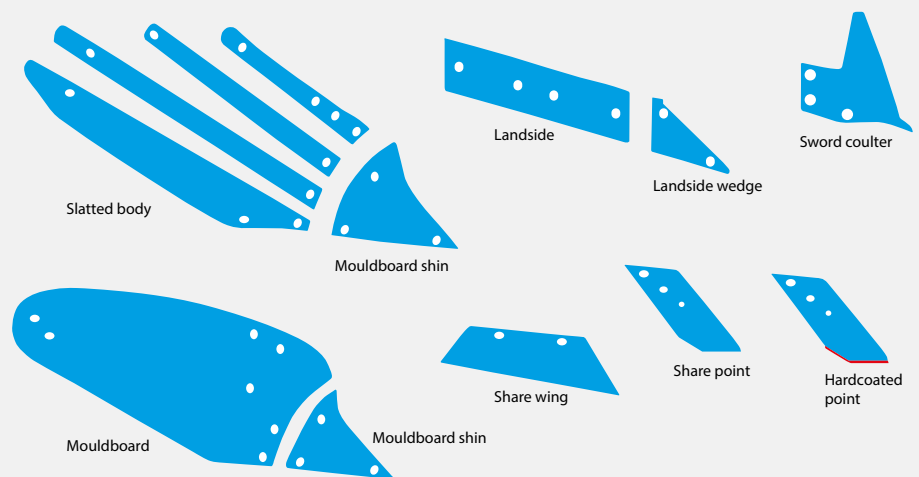
- The overlapping arrangement of the shares prevents roots and other foreign objects from becoming snagged.
- Their high material density and high degree of hardening guarantee low wear and resistance to failure.
- The wear zones on the share wing are considerably larger than on conventional shares.



Plough body construction

The material, cross-section and geometry of the replaceable share points guarantee low wear and good entry characteristics. The extra wide landsides with large soil contact area improve plough guidance and are four-way reversible. With a wearing area accounting for a substantially greater proportion of the sword couler, optimum utilization is assured. The mounting lies behind the cutting tools, where it is protected against wear and damage.

By being open at an angle to the rear and upwards, the cutting edge



presents no opportunity for stones, roots, etc. to become trapped. A special hard-metal coating on the share point yields an as yet unsurpassed

service life, and substantially greater cost-efficiency. The points are hard-faced on one side from below, thereby producing a self-sharpening effect.



Safe on the field and highway alike



Depth-control wheel

The special design of the depth-control wheel ensures high ground clearance, and thereby the ideal work position and safe and shock-free pivoting of the wheel during turnover. Where permitted by the number of furrows and selected working width, ploughing is possible right up to the edges of fields, ditches, fences, etc.

- The ploughing depth is set quickly and easily by means of the pin adjuster.
- The depth wheel adjusts automatically to changes in the working width.



Depth and transport wheel

The combined depth and transport wheel is an effective solution for safe road transport and for ploughing of four or more furrows. It can be changed over quickly and easily between the working and transport positions.

- The working depth is easily set by means of the pin adjuster and bracket, without the need for the wheel to be raised.
- The plough is locked in the mid-position for transport.
- The depth and transport wheel also permits reversing.



Hydraulic depth and transport wheel

Where soil conditions involve changes between shallow and deep ploughing or between heavy and light soils, adjustment of the working depth is essential for a good result. The hydraulic depth and transport wheel permits ploughing at an even depth under such conditions.

- Even with a high plough weight and on heavy soil, the working depth can be adjusted hydraulically with a single double-action control unit.
- The integral damper assures gentle reversal of the wheel during turnover.



Photo:
OF-Version





Technical data

EurOpal 5	Box-section frame 110 x 110 x 8 mm				EurOpal 6	Reinforced box-section frame 110 x 110 x 8 mm	
Number of furrows	2	2 + 1	3	3 + 1		4	4 + 1
Turnover mechanism	E 90	E 90	E 90	E 90		E 100	E 100
Working width (cm approx.)	60 – 100	90 – 150	90 – 150	120 – 300		120 – 200	150 – 250
Weight (kg approx.)	552	715	707	870		907	1.070
Max. kW/PS	44/60	59/80	59/80	74/100		81/110	96/130
Underframe clearance (cm) ²	75/80	75/80	75/80	75/80		75/80	75/80
Interbody clearance (cm)	90/100	90/100	90/100	90/100		90/100	90/100
Leg dimension (mm)	70 x 30	70 x 30	70 x 30	70 x 30		70 x 30	70 x 30
X auto-reset option ¹	x	x	x	x		x	x

VariOpal 5	Box-section frame 110 x 110 x 8 mm				VariOpal 6	Reinforced box-section frame 110 x 110 x 8 mm	
Number of furrows	2	2 + 1	3	3 + 1		4	4 + 1
Turnover mechanism	E 90	E 90	E 90	E 90		E 100	E 100
Working width (cm approx.)	44 – 100	66 – 150	66 – 150	88 – 200		88 – 200	110 – 250
Weight (kg approx.)	567	794	727	950		1.067	1.290
Max. kW/PS	44/60	59/80	59/80	74/100		81/110	96/130
Underframe clearance (cm) ²	80	80	80	80		80	80
Interbody clearance (cm)	100	100	90/100	90/100		90/100	90/100
Leg dimension (mm)	70 x 30	70 x 30	70 x 30	70 x 30		70 x 30	70 x 30
X auto-reset option ¹	x	x	x	x		x	x

¹ Approx. 15% additional weight for X model (with automatic non-stop overload safety system)

² On X model: underframe clearance only 80 cm

³ Only with 90 cm interbody clearance

⁴ Only with 90/100 cm interbody clearance

All statements, measurements and weights given represent standards subject to continuous further development and are therefore not binding. The weights given always refer to standard equipped implements. We reserve the right to change specifications

Service decides



When you have bought a machine from LEMKEN, the well-known, almost proverbial LEMKEN service starts. 18 customer-oriented factory branches and outdoor storage areas in Germany as well as our own sales companies and importers in more than 40 countries, and a strong dealer network, ensure that machines and spare parts are supplied quickly.

If a part is not in stock, it can be delivered to the customer within 24 hours via the LEMKEN logistics centre which is manned round-the-clock 365 days a year.

Knowledge from the LEMKEN specialist

Well trained customer service technicians are available to farmers, contractors and trade, who are using machinery for the

first time, as well as for professional maintenance and repairs. Thanks to regular training courses, LEMKEN customer service is always up to date with the latest LEMKEN technology.

Original spare parts from LEMKEN

LEMKEN wearing parts are designed for a maximum service life. High-quality materials, the latest production methods, and an intensive quality control ensure a long service life. Therefore, all original spare parts bear a unique identification with the registered LEMKEN trademark. Original spare parts can be ordered at any time online on the Internet via the LEMKEN information and ordering system.



LEMKEN GmbH & Co. KG
Weseler Straße 5
46519 Alpen, Germany
Phone +49 2802 81-0
info@lemken.com
lemken.com

Your LEMKEN dealer:

