

DILO MACHINES



NEEDLE LOOMS
FOR
STRUCTURING
AND PATTERNING

Model Series
DI-LOOP und
DI-LOOP S



◀ DI-LOOP VSXB 45
working width ww = 4,5 m

NEEDLE LOOMS FOR STRUCTURING AND PATTERNING

Model Series DI-LOOP and DI-LOOP S

As the leading specialist DILO offers a complete production range for all needle looms with all working widths, stroke frequencies, needle densities and needling technologies.

DILO as inventor of the structuring and patterning technique DI-LOOP offers the DI-LOOP and DI-LOOP S model series for this important field of needle felting technique. Since the end of the sixties DI-LOOP machines have been the basis for our reputation of reliability and innovative power. The demand for higher productivity, ease of operation and low maintenance, which has been realized in the types DI-LOOP VA, VS and DA, DS, is also constantly growing for the DI-LOOP structuring looms.

Instead of a perforated stitching plate the DI-LOOP machines use lamella tables in connection with fork needles. This may result in three completely different structured materials:

- rib type materials,
- velour type materials,
- patterned needle felts.

The main applications for DI-LOOP products are floor and wall coverings and automotive interior linings, especially for medium and high area weights and medium to coarse fibres.

The position of the fork needle is the factor which determines the type of material produced, rib or velour. For patterning the position of the needle is used in the same way as for rib type material.

The **DI-LOOP** model series offers universal structuring looms with stroke frequencies of up to 1,200 min⁻¹ and two types:

- DI-LOOP VA for manufacturing velour and ribbed material
- DI-LOOP DA with hydraulics especially for patterning, but also for the production of velour and rib type material without using the hydraulics.

The **DI-LOOP S** model series for highest performance with stroke frequencies of up to 1,750 min⁻¹ and through-put speeds of more than 20 m/min also comprises two types:

- DI-LOOP VS for high-speed structuring of DI-LOOP velour or rib type materials,
- DI-LOOP DS with servo hydraulics for high-speed patterning with three-dimensional relief structures.

Standard **working widths** range from 2.5 to 6.5 metres, rising in 0.5 metre increments.

In the first line the patterning function is created by the hydraulic lifting and lowering movement of the lamella table and the arrangement of the needles in the board according to the pattern requested. For better contrast of the pattern, multi-colour two-layer pre-needled felts are often used. The pitch of the lamella grid is available in 3 mm, 3.5 mm, 4.7 mm and 5.5 mm.



▲ DI-LOOP DA 45 ww = 4,5 m



◀ DI-LOOP DS 45



Hydraulic unit DA ▶



◀ Hydraulic unit DS



▲ DI-LOOP DS 25 ww = 2,5 m



▲ Lamella table

In addition to the **hydraulic patterning** also **advance patterning** at all DI-LOOP types can be applied, which allows production speeds of more than 20 m/min.

The **lamella table** is divided into table base and grid top so that the grid can be exchanged quickly by one with a different pitch. As special accessory a stripper plate with quick clamping system is available which facilitates this fast change to other pitches and cleaning, so that the exchange of the whole needling zone comprising needle board, stripper plate and lamella top can be done in about two hours.

Upon request the needle looms of the DI-LOOP model series may be equipped with a de-dusting device **DI-DUST** to prolong the cleaning intervals.

The machines are characterized by a very solid frame construction which suits the maximum needling forces. For all parts and components it is important that they are highly free from vibration.

Feeding system and pair of draw-off rollers are assemblies standing separately, which are fixed to the ground independently from the machine frame. They carry the **safety guards** which are closed mechanically and controlled electrically. The safety guards also serve to reduce the sound emission.

The **pressure rollers** on pair of feeding rollers and pair of draw-off rollers are controlled pneumatically and can be adjusted precisely to the thickness of the material.

The needle loom itself is mounted on **spring elements** and vibration is not transmitted to the floor. The machine does not require any foundation and can be put onto the industrial floor.

The **needle beam** consists of one piece and is especially rigid. To eliminate the thermo effect of the components of the needling zone, it is cooled by fans.

The **pneumatic quick release clamping system** allows an exchange of the needle board within one minute, as it can be released and removed, sliding like a drawer. A **positioning pin** adjusts the board quickly and correctly so that the needles are centred towards the edge of the holes. Fast exchanges of the needle board avoid longer, cost intensive machine downtime.

For the production of velour- and rib-type materials needle densities range from 3,000 to 7,200 per metre of working width when fully equipped. For patterning special boards with a drilling matrix of 3.5 x 3.5 mm distance of drillings are used, so that a density of drillings of 14,300 per metre is available.

The machines of the DI-LOOP and DI-LOOP S model series use **standardized elements and assemblies** which are manufactured in large quantities and with ultra precision.

The mechanisms for needle beam drive, main shaft and connecting rods are separated completely from the needling zone and **sealed**.

The machines of the DI-LOOP S model series do not only have an **automatic lubrication**, but also have a so-called “**drainer**” for each eccentric bearing, which discharges the spent lubricant into an accumulating container within the housing of the module, sealing the eccentric unit. From this deposit the lubricant can easily be removed once a year by means of a suction device (DILO accessory). The needle beams are guided by the **DILO-rocker arms**. This unique guiding system only works with rolling and non-sliding movements. The functional surfaces are lubricated for lifetime, perfectly sealed and nearly free of wear and maintenance. The lower wrist pin bearings are also perfectly sealed. Lubricants cannot leak and fibre dusts cannot penetrate.

Stripper and stitching plates are adjusted by special **spindle-type jacks**, which are solidly clamped to avoid wear due to vibrations. These jacks are lubricated for lifetime. The final position is controlled electrically to avoid damage by displacement. To facilitate feeding of the material or exchanging the needle boards, the main drive automatically positions the needle beam in the top dead center when stopping.

All functions are controlled by means of a PLC to provide easy operation, precise repeat accuracy, clear display and detailed messages and help texts in case of an error. The PLC as well as the power supply, inverters for the drives and other appliances are installed in a separate switch cabinet to meet all electrical safety requirements. Connection for a telediagnosis is provided.

The operator desk, standing nearby the machine for fast access by the operators, is equipped with graphical display for evident setting the machine parameters, displaying any messages and storing recipes.



Two counter-rotating **main shafts** provide a nearly complete balancing of the rotating and oscillating masses. The main shafts are of modular design and consist of “**eccentric units**”, which are connected by couplings and intermediate shafts.

The roller bearings of the main shaft, the main and crankshaft bearings are lubricated automatically. This **automatic lubrication** drastically minimizes the maintenance of the machines. The lubrication is controlled in a reliable way by four independent securing elements:

- the temperature control of the crankshaft bearings, which stops the machine as a precautionary measure when there is an undue increase of temperature,
- the electric control of the completion of the lubrication cycle,
- the electric control of the level of lubricant in the tank,
- pressure control of the lubrication system for the crankshaft bearings

For developping new pattern there is our simulation software DI-SIGN available. You can try and modify any parameter and the result is displayed on the screen of a computer for evaluation of the possibilities.

Since their invention in the sixties, the DI-LOOP model series have set a leading standard as regards performance, reliability, security and ease of operation combined with minimum maintenance.



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