Draw Frames

TRÜTZSCHLER
SPINNING

Content

State-of-the-art draw frame technology

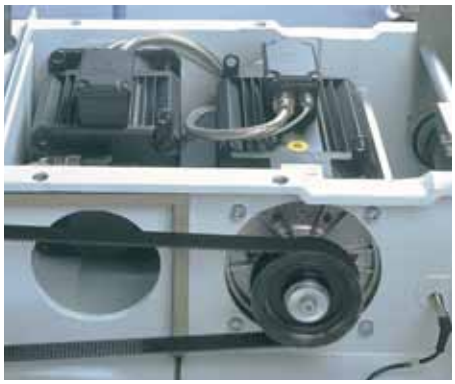
Controlled quality with high productivity

The draw frame is the quality filter of the spinning mill; errors in the draw frame sliver result inevitably in yarn defects. Hence, since quality can no longer be improved after the draw frame, the sliver quality at the last draw frame passage is of decisive importance: The slivers must be monitored in detail, metre by metre, to meet self-set quality standards. Precisely this is a key strength of the Trützschler auto leveller Draw Frame TD 03.

The auto leveller draw frame is available in two versions: As TD 03 for the high production area up to 1,000 m/min, and as TD 03-600 for combing mills with a delivery speed of up to 600 m/min. Both versions are optimised for their respective area of application, and equipped accordingly.

The version without auto levelling, the Trützschler Draw Frame TD 02, has been specifically designed for highest efficiency at low space requirement.

Top roll loading with AUTO RELEASE during standstill



Maintenance-free servo drives with digital control

Graphical displays support operation and maintenance

The additional drive (right in picture) enables the self optimisation of the break draft (AUTO DRAFT)

Autonomous can changer without mechanical connection to the draw frame

Smooth components and covers with optimised shape reduce contamination

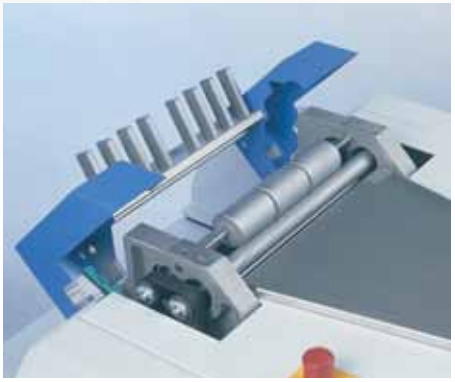
Simple entry of lot data

Computer control with touch screen operation

Automatic, self-adjusting lap monitoring is integrated in the top roll support

The hoods and the drafting system can be opened without tools within a few moments

Pneumatic sliver threading device



Also the seldom required access to the jockey rollers …

Draw frame concept for the future

Computer controlled direct drives instead of differential gears, angular gears and change wheels – this is an outstanding feature of Trützschler draw frames. In addition, there is a pneumatically loaded drafting system and a short-wave adaptive levelling system with Trützschler sensors to measure slivers fed and delivered at auto leveller Draw Frame TD 03.

New concept of a draw frame without levelling

Trützschler's new Draw Frame TD 02 presents an entirely new concept of a draw frame without levelling. It is space-saving, economical and easy to operate.

Self-optimising functions - a novelty in the field of draw frames

The draft depends both on the spinning plan as well as on the selection of the material-related break draft. If set incorrectly, the imperfection values in the yarn can needlessly increase, for instance. Fibre crimp and fibre-to-fibre friction play an important role as well. Hence, Trützschler developed for the auto leveller Draw Frame TD 03 the optional self-optimising function AUTO DRAFT for the break draft. The self optimising function OPTI SET, which finds the main drafting point fully automatically, is standard.

Can changer – automatic and autonomous

The automatic can changer is designed as an independent machine unit for the draw frame without and with levelling. Since it has no mechanical connections whatsoever to the draw frame, maintenance points like angular gear and cardan shaft are eliminated. In addition, the separate drive allows stepless adjustment of the sliver coiling geometry.

Simplified maintenance as main development objective

Maintenance-free operation is an important goal of every new Trützschler development. Hence, Trützschler draw frames are equipped with many maintenance-free motors; permanently lubricated bearings replace lubrication nipples and expensive central lubrication systems. The covers can be opened without tools. The large capacity filter box is free from error prone mechanics and must seldom be emptied. Smooth, shape-optimised components prevent fibre build-up and contaminations - and these are just a few of many examples.

Accessibility: ideal, operation: simple

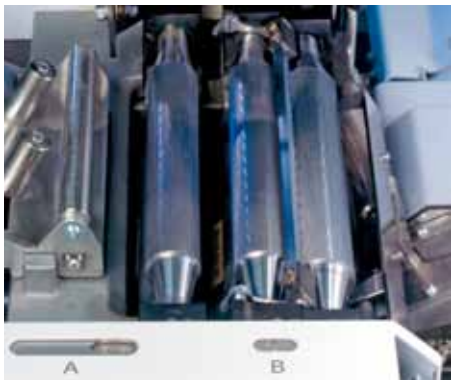
The main covers of the draw frame can be opened within a few seconds. The entire working area is clearly arranged for the operator and can easily be accessed. The upper part of the drafting system can be opened sideways. The top rolls remain in the load supports and can be removed at the touch of a button. The sliver is pneumatically fed into the output measuring funnel in a reliable manner.

Self-optimisation of the break draft with AUTO DRAFT

Casing for optimum accessibility

Integrated quality monitoring

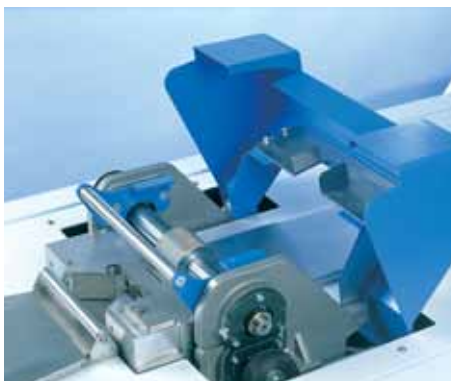
Direct drives for highest possible levelling dynamics



Precise quick adjustment of bottom cylinder distances

Optionally, automatic can changer for round or rectangular cans

Draw Frame TD 02 without levelling



… or to the feed sensor is simple and quick

Wider drafting system also for bulky material

New Trützschler Draw Frame TD 02

Entirely new draw frame concept for a draw frame without levelling

Hitherto, draw frames without leveller were developed from leveller draw frames by omitting components. Trützschler went a different way and developed a new draw frame without levelling, the Trützschler Draw Frame TD 02.
To avoid technological and qualitative compromises, the reliable drafting system of the auto leveller Draw Frame TD 03 has been applied:

- 4-over-3 drafting system geometry
- individually pneumatically loaded top rolls
- digitally controlled, maintenance-free, highly dynamic servo drive
- pressure bar in main draft area
- quick drafting system adjustment
- perfect continuous suction with low energy-efficient filter depression
- pneumatic web threading

By arranging the drafting system on the can changer, the Trützschler Draw Frame TD 02 does not take up much space

The drafting system is positioned on the can changer

This drafting system has been placed directly onto the can changer. Thus, the Trützschler Draw Frame TD 02 requires only the same space as a can changer. The applied can changer is largely identical to the one used for Trützschler Card TC 07 and Draw Frame TD 03. This can changer is naturally also available for all common can sizes.

Digital servo drive

Energy and maintenance intensive mechanical gears have been omitted. The coiler plate in the can changer has an individual drive.
There are two creel versions:

1. Feed creel, double-row, for 6-8 cans from 600 to 1,000 mm diameter
2. Power creel, double-row, for 6-8 cans from 600 to 1,000 mm diameter.

The power creel is also separately driven by a digitally controlled servo motor. This reduces maintenance and decreases current consumption by eliminating mechanical power transmissions.

The diagram shows the clear and compact structure of Trützschler Draw Frame TD 02

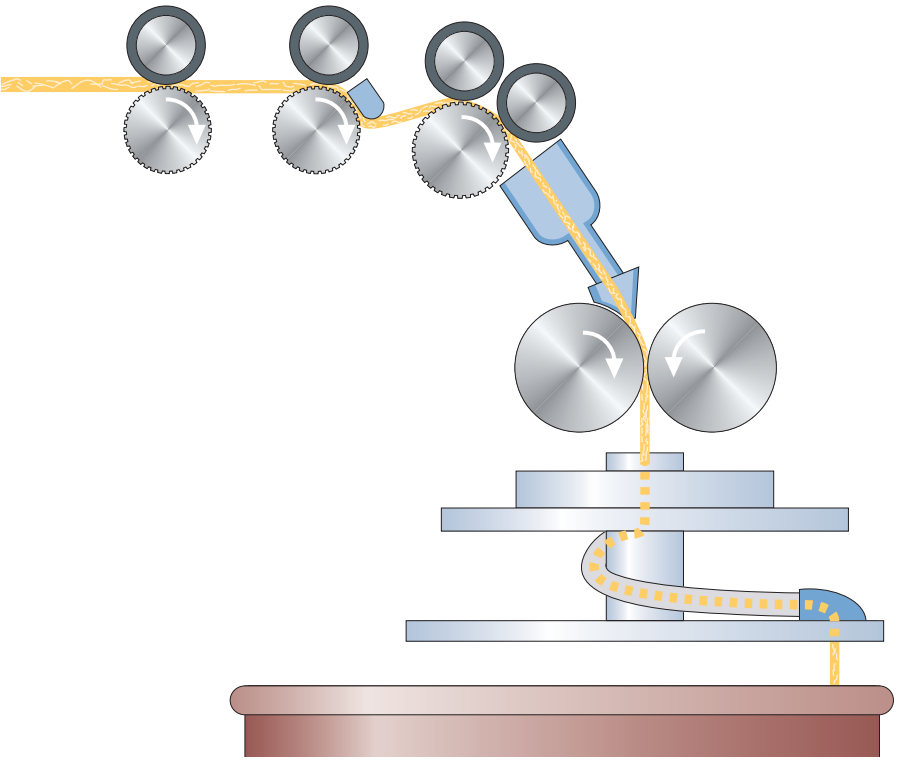
Easy to operate – simple to maintain

The digital drive in the drafting system and the individual drives of the creel (option) as well as of the can changer allow for stepless speed settings on the monitor of the draw frame control.
Due to the individual drives, stepless adjustment of the tension draft between creel and drafting system, and coiler plate speed (sliver coiling geometry in the can) is also possible.
The new Draw Frame TD 02 also features the reliable microcomputer control of the Trützschler draw frame, as well as a colour monitor.
Operation takes place from one side. The drafting system is opened up to the back. This gives the operator an ergonomically sound, completely unobstructed working area. The monitor is also directly within the visual field.

The drafting system is largely identical to the drafting system of Trützschler Draw Frame TD 03

The Trützschler Draw Frame TD 02 is operated via the colour monitor

Our tried and tested drafting system geometry – optimised for additional sliver evenness



Trützschler has further improved the reliable 4-over-3 drafting system with pressure bar. The 4th top roll ensures careful sliver deflection at the delivery side of the drafting system. The adjustable pressure bar in the main draft area ensures controlled guidance of even short fibres. The usable drafting system width was increased by 15 mm compared to the predecessor draw frame, improving the running properties of high-bulk synthetic fibres.

Systematic prevention of lap formation

Particularly under unfavourable climatic conditions it is possible that laps develop at the drafting cylinders or top rolls. This is essentially prevented by the large diameter of Trützschler rolls. In addition, the top roll supports have integrated lap formation monitoring. It automatically adjusts itself to zero point every time the machine starts; hence, there is no need for a new adjustment, e. g. after replacing or regrinding the top roll.

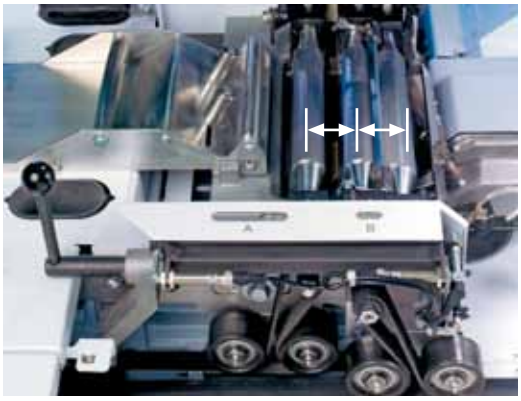
Simple and quick adjustment of drafting zone widths

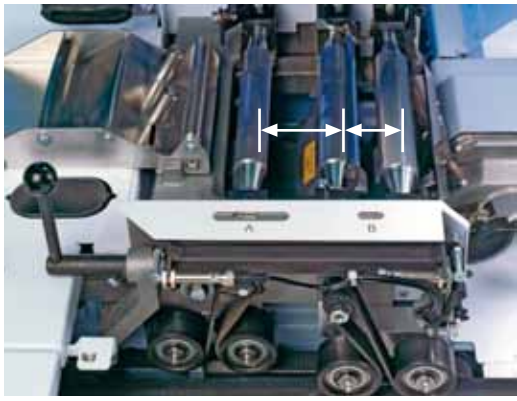
The drafting system rolls are precisely positioned on parallel guides. Since the nip distance can be read on a dial, it is not necessary to use any gauges. Top roll support, top rolls and bottom cylinders are firmly connected to each other and are automatically adjusted as well. Due to a special belt guide, it is not necessary to retension the belts after readjustment.

Optimum setting of strong suction

The suction system adapted to the drafting system geometry ensures excellent dust removal from the slivers. The strippers of the bottom rolls are integrated into the suction hoods. When readjusting the bottom rolls, they both are automatically adjusted as well, thus maintaining optimum geometry to the rolls.

The drafting system can be opened with one single action. The top rolls remain safely in the top roll supports





The drafting system is equipped with a quick adjustment unit. The drafting zone widths can be directly read from two dials (A = break draft zone; B = main draft zone)

AUTO DRAFT – automatically reaching the optimum

AUTO DRAFT is a fully automatic self optimisation of the break draft for the auto leveller draw frame. The system automatically determines a recommendation for the ideal material-related break draft in less than one minute. AUTO DRAFT can be integrated into the Draw Frame TD 03 as an option, but can also be retrofitted.

Break draft: One of the decisive factors for yarn quality

The degree of break draft influences the yarn evenness and amount of imperfections, especially neps in the yarn. Hence, an unoptimised break draft often results in bad yarn values. Compared to this, the influence of the total draft on yarn quality is less important. Furthermore, it is only variable within limits, as it is determined by the spinning plan.

Self adjustment in approx. 60 seconds

At the touch of a button, the draw frame moves along the entire possible break draft zone, measuring the draft force. After approx. 1 minute, all necessary information is available; the control evaluates it and displays the ideal degree of break draft. The operator accepts this value and the draw frame can start production.

Suitable for all materials

AUTO DRAFT is suitable for all materials. The system considers fed fibre mass, fibre characteristic pertaining to fibre crimp, fibre-fibre friction, fibre-metal friction, as well as degree of main draft.

Ideal during frequent lot change

Depending upon the requirements of the spinning mill, two different applications present themselves:

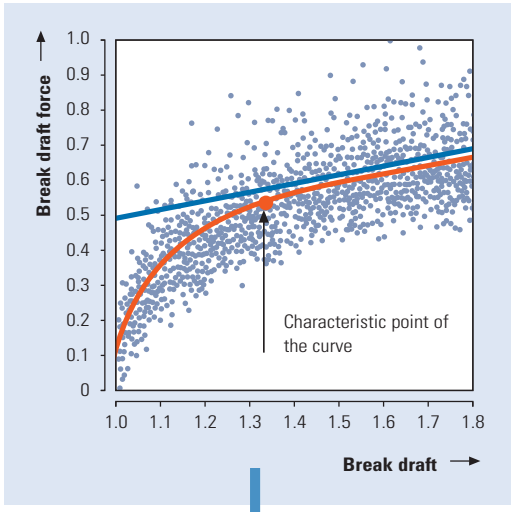
1. In productions with only one material, a single draw frame can be equipped as “pilot machine“ with AUTO DRAFT. The optimum break draft is determined on this draw frame and then manually transferred to the other machines.
2. In a highly flexible installation with many different materials and frequent material changes at the draw frames, it makes sense to equip all draw frames with AUTO DRAFT.

The principle of self-adjustment

Start of the automatic break draft determination

Duration of optimisation: **40 sec**

Material supply: 600 m sliver length



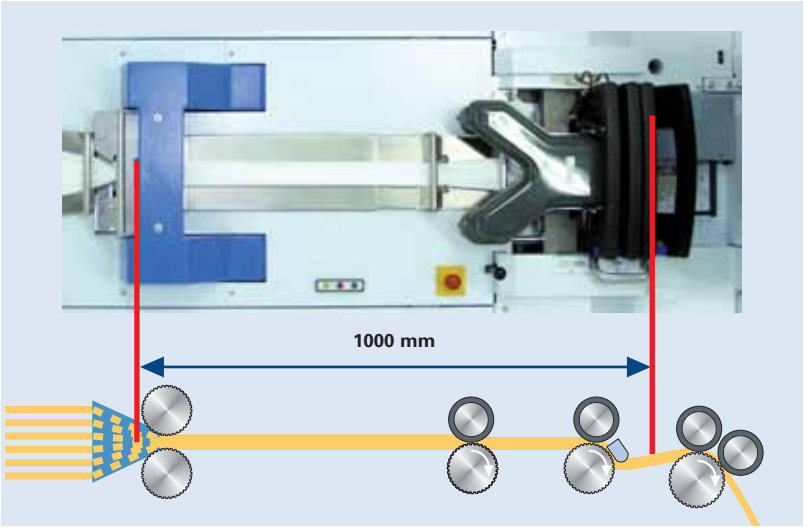
The ideal point is calculated from a large number of single measurements

Result of automatic break draft determination

OPTI SET –
Levelling quality without compromises

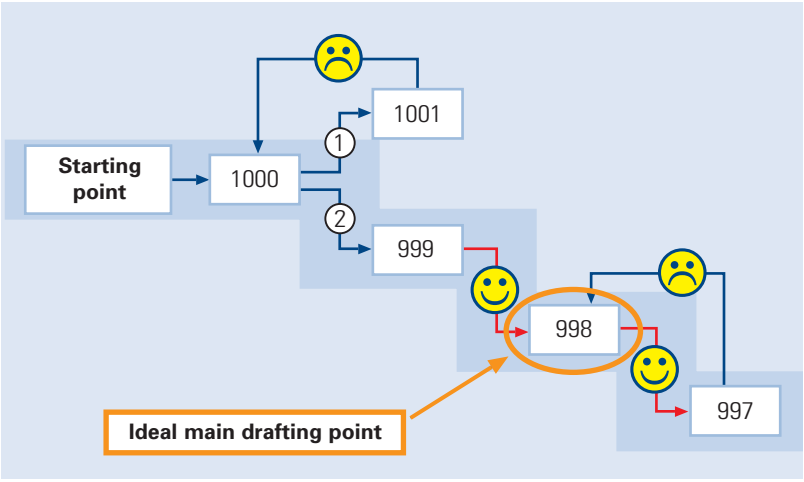
On auto leveller draw frames, the optimum setting of the main drafting point is decisive for the levelling quality. Establishing this point usually requires extensive laboratory trials (sliver tests).
With Trützschler's auto leveller Draw Frames TD 03 this is not necessary, since the OPTI SET self optimising function is a standard feature.

OPTI SET determines the optimum value fully automatically by considering the current general conditions, like machine settings, material characteristics and ambient atmosphere.



The distance between sensor and main drafting zone is approx. 1,000 mm

The fed slivers are scanned by a sensor; this is followed by a corresponding time-lagged levelling action as soon as the material has reached the main draft zone, which is 1,000 mm away. This time lag between measurement and levelling action determines the main drafting point. The exact position depends, among other things, on machine settings as well as material and ambient atmosphere.

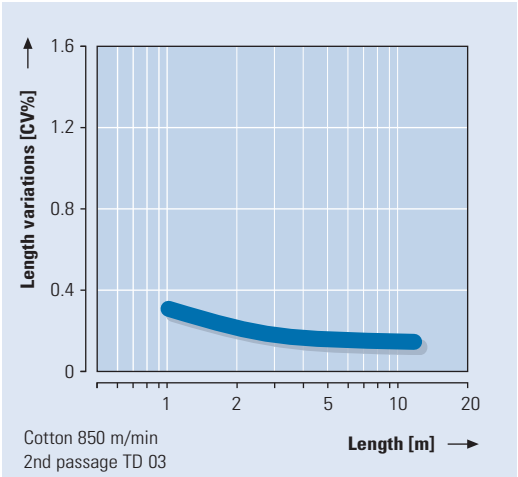


Functional principle of the OPTI SET self-optimising function

The operator starts the function at the touch screen monitor. The draw frame starts with the standard value (e.g. 1,000) and successively checks slightly deviating values. During this process, the CV values of the fed slivers and the CV values of the delivered draw frame sliver are measured and evaluated in relation to one another.
Once the optimum quality value is achieved, it is recommended to the operator. He acknowledges the setting on the monitor – the setting process is completed. The otherwise common sliver and laboratory tests are not required with auto leveller Draw Frame TD 03.

SERVO DRAFT– less correction length, more reliable and maintenance-free

Short-term levelling as achieved by SERVO DRAFT, cannot be realised with conventional concepts. SERVO DRAFT provides extremely short correction lengths, thus requiring only very few produced sliver lengths to compensate for deviations from the target sliver weight.
Apart from suitable drives, this requires a precise collection of actual values, fault-free signal processing, and direct conversion of the levelling signal.
With the Trützschler measuring funnel, SERVO DRAFT – unlike conventional sensing and grooved rolls – is able to measure incoming slivers more quickly and precisely. The measuring tongue within the funnel has a considerably smaller mass than a sensing roll, thus enabling a 2.5 times higher scanning frequency. In doing so, a single funnel covers the usual sliver count range.
Another advantage: The Trützschler measuring sensor requires no gear, whereas with conventional solutions an angular gear must constantly be accelerated and retarded.
This means fewer maintenance points, fewer fault sources and higher levelling dynamics. This way it is possible to safely reach the shortest correction lengths at high delivery speeds.

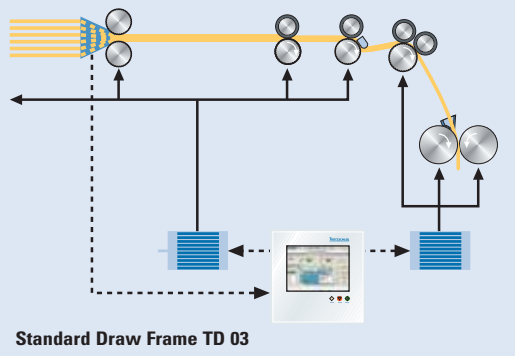


The length variation curve shows how well the auto levelling system SERVO DRAFT works

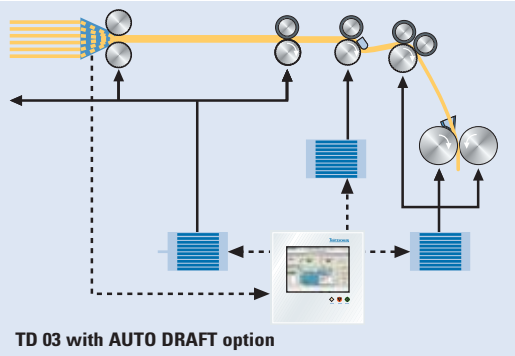
A reliable feed sensor records the mass of all fed slivers

Optimised sliver evenness by means of specific measurement and "experience values"

The draw frame levelling developed by Trützschler has already proved itself several thousand times. This is due to the fact that it uses not only precise measurement values for calculating a sliver that is as even as possible, but also experience values, i.e. expertise which is integrated in the software. This influences the calculation at varied intensity and leads to significantly better results.
The levelling of variant TD 03-600 has been specifically optimised for applications below 600 m/min. This concerns arrangement of the motors and fine-tuning of the levelling software.



Standard Draw Frame TD 03



TD 03 with AUTO DRAFT option

The draw frame control processes the signal of the feed sensor and activates the two or three (when equipped with AUTO DRAFT) servo motors digitally

Levelling also during can change

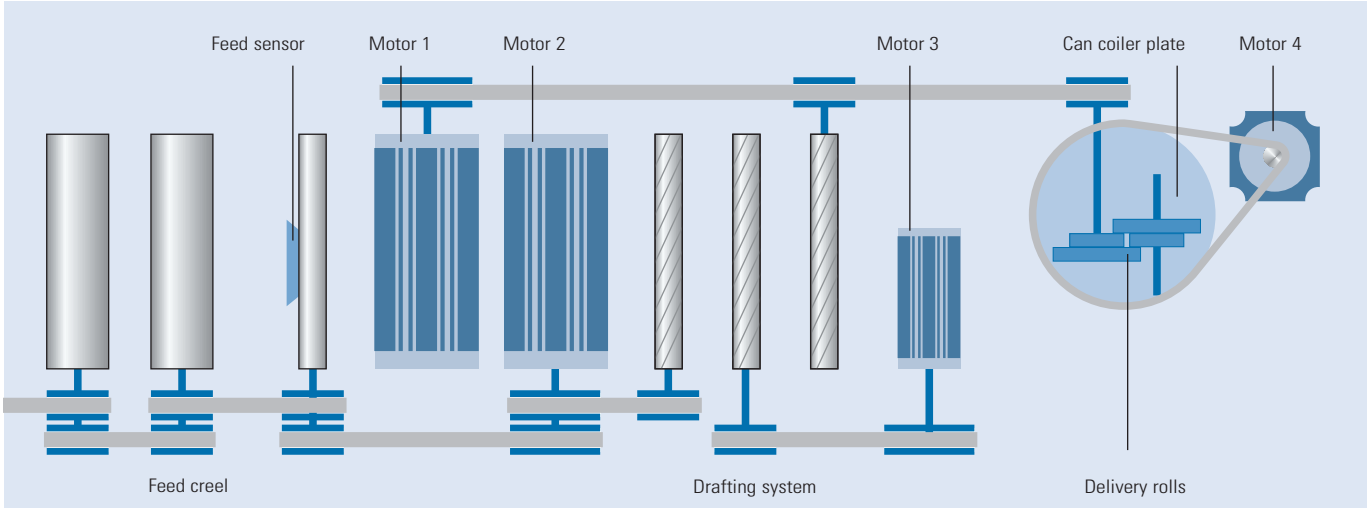
In principle, levelling takes place in the entire speed range of the draw frame. Even when reducing speed before und during run-up after a can change, SERVO DRAFT short-term levelling remains in operation. Thus, in contrast to draw frames with unregulated main motors, each metre of draw frame sliver has optimum quality.

Maintenance-free and precise – Optimal due to digital servo motors

The machine is equipped with servo motors that drive the cylinders of the drafting system via toothed belts, using the shortest way. The computer control of the motors makes it possible to dispense with differential gears as well as change wheels for draft and delivery speed. On leveller draw frames, the delivery speed and draft – and thus also sliver count and evenness of draw frame sliver – are realised via rotational speed or the speed difference between the motors.

Setting delivery speed and sliver count in a simple and quick way

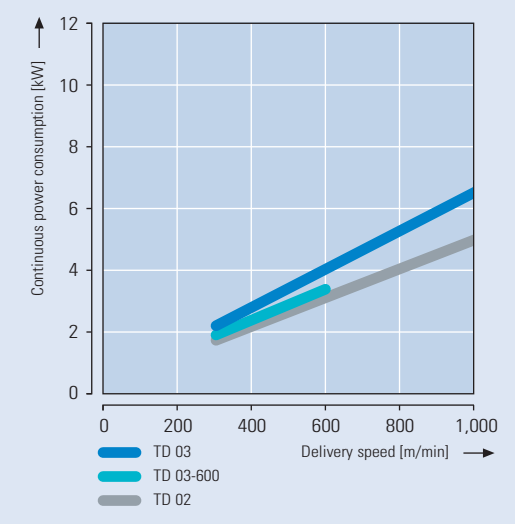
Replacing change wheels, as required on other draw frames, for instance to change the total draft, does not apply to the Trützschler auto leveller Draw Frame TD 03. Furthermore, the settings established for a certain material can be stored and called up at any time when processing the same raw material again. There is no faster way to perform a new setting. This technology also sets benchmarks concerning flexibility and availability, and that at delivery speeds of up to 1,000 m/min, for which all drives, bearings, etc. are designed.



The cylinders of the drafting system are powered by digital servo drives.
The diagram shows auto leveller Draw Frame TD 03 with AUTO DRAFT option

Less energy consumption for more economic efficiency

Due to the direct drive and elimination of gears, the current consumption of the draw frame is especially low. Depending on machine application, power consumption is approx. 0.020 – 0.030 kWh per kg of produced draw frame sliver.



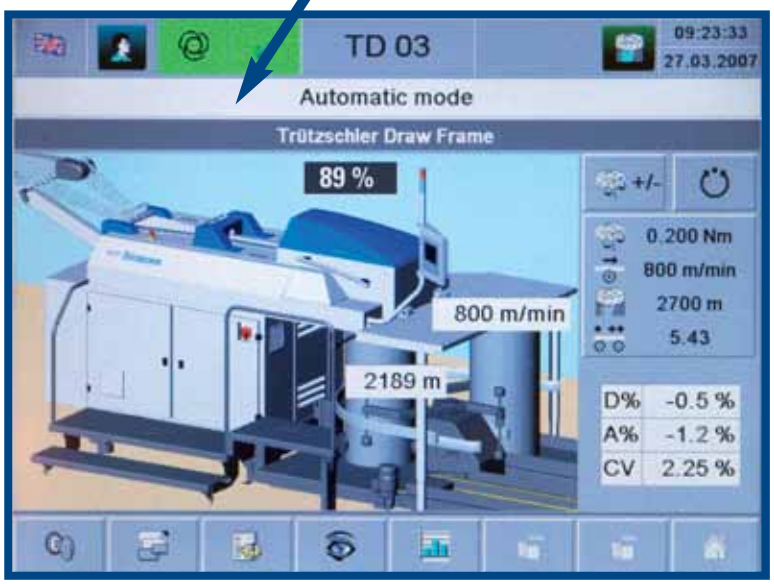
Energy consumption of Trützschler draw frames is very low

Just one finger:
Simple operation via touch screen

The application of a touch screen enables simple operation, largely via language-independent symbols and diagrams. Furthermore, it is possible to display only those operating functions that are necessary or practical in the particular situation.

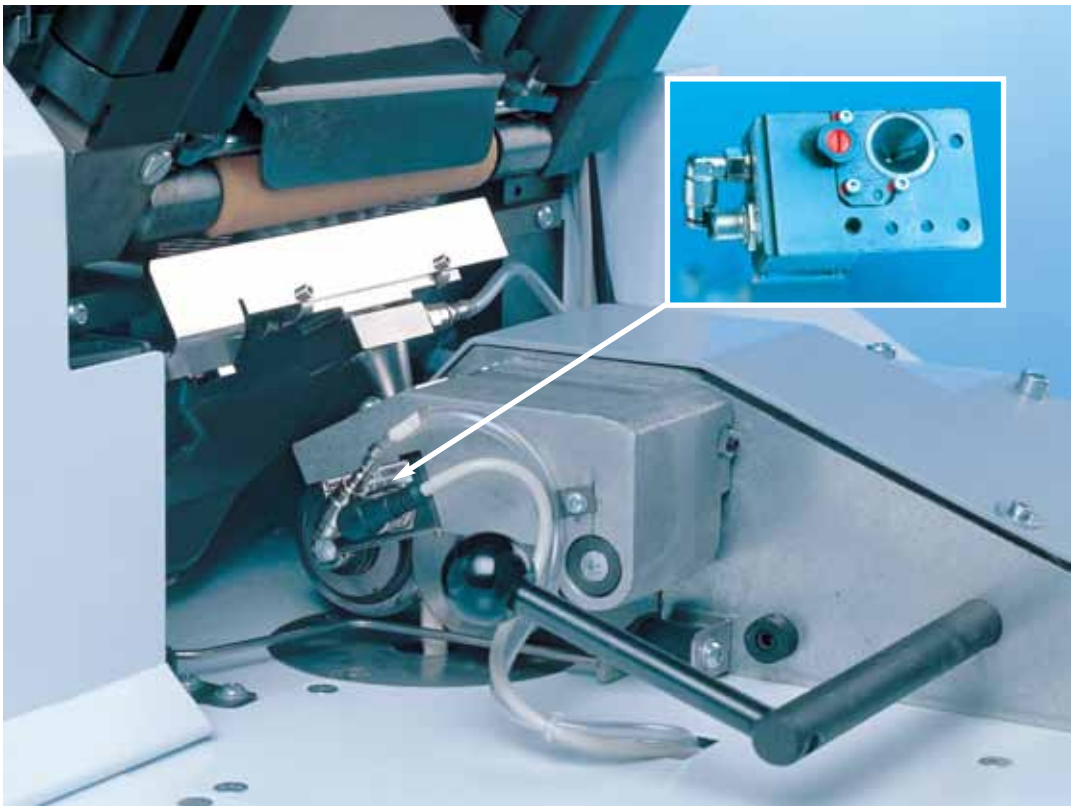
The display also has clear advantages in the event of a machine fault: It shows the point of failure and inserts simultaneously an accordingly marked detailed picture or diagram of the particular fault.

The display of the auto leveller draw frame is swivel-mounted and located in the direct working area of the operator

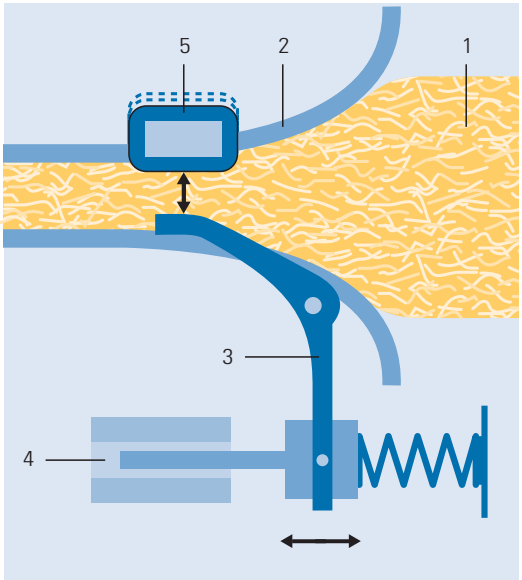


SLIVER FOCUS – the guarantee for constant sliver count

SLIVER FOCUS, the output measuring funnel of the auto leveller draw frame's quality monitoring does not miss anything – it measures every inch of sliver prior to deposit in the can. Should the sliver deviate in its fineness or be faulty, SLIVER FOCUS transmits a warning or stops the draw frame. The limits for warning and stopping can be defined individually. Furthermore, SLIVER FOCUS monitors permanently and online the production, which reduces the otherwise necessary regular laboratory tests.



The sensor at the delivery side of the SLIVER FOCUS system is positioned directly in front of the delivery rolls



With one sensor it is possible to measure a wide range of sliver counts

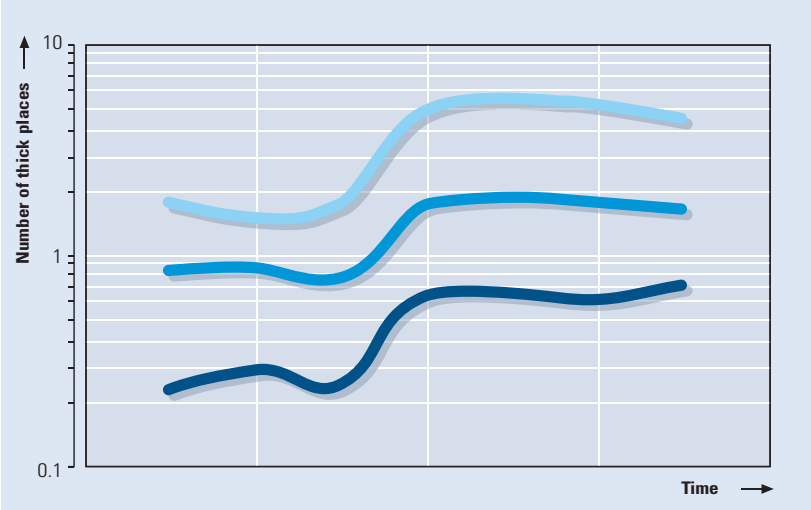
1 Fibre sliver
2 Measuring funnel
3 Spring-loaded measuring lever
4 Conversion of the mechanical signal into an electrical one
5 Here, the sensor is adjusted to the sliver count

The comparison with a match shows: The mass of the measuring lever has been reduced to a minimum to ensure a high scanning frequency

Standard thick place detection as early warning system

Part of the targeted error analysis of the leveller draw frame is also a precise sliver monitoring for thick places. This not only improves yarn quality, but also optimises the efficiency of spinning and winding machines since less clearer cuts are required.

All Trützschler auto leveller draw frames – same as the cards – are prepared for connection to the Trützschler Data Management System T-Data.



The thick places in the draw frame sliver correlate with the thick places of the Classimat test in the yarn

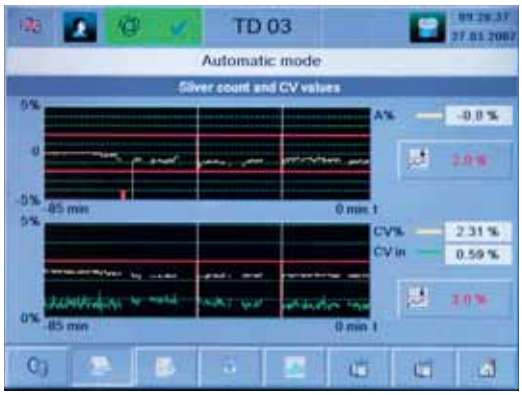
Classimat L defects

Ring yarn Ne 20
(30 tex) (1/100 km)

Rotor yarn Ne 18
(33 tex) (1/100 km)

Thick places in the sliver

Draw frame sliver Ne 0.1
(5.8 ktex) (1/km)



The results of quality monitoring are clearly displayed on the monitor of the draw frame control

Spectrogram monitoring ensures that the leveller draw frame is switched off when the individually defined quality levels are exceeded; spectrogram analysis shortens the process of troubleshooting and supports quality management. Once an error appears in the spectrogram, the possible failure cause is marked on the gearing diagram

Perfection also at the feed area of the draw frame

The feed area of the draw frame can be executed as solid feed creel or power creel. Both variants are made of torsion-stiff aluminium profiles. The supports are height adjustable and can be adapted to the corresponding can height.

The power creel is ideal for delicate slivers (e.g. from the comber) and for sliver feed speeds of more than 120 m/min

Automatic can changer = high efficiency

Trützschler draw frames are generally equipped with an automatic can changer. The cans are fed horizontally with a positively driven can transport system, which ensures trouble-free can change. The operator can simply push the cans via a ramp into the can changer.
The full cans are delivered via a horizontal can delivery ramp into a magazine, cans up to 600 mm diameter optionally also on a transport carriage. When using cans with a diameter of 1,000 mm, the can changer can also be sunk into the floor. In this case it is possible to remove the cans at ground level.

The reliable positively driven can feed ensures controlled can transport

The automatic can changer for all can sizes is standard on Draw Frames TD 02 and TD 03

Sliver separation – functionally reliable and maintenance-free

Concerning sliver separation during can changing, Trützschler has developed a simple solution for auto leveller draw frames: A short thin sliver section is produced by a selection of the drafting system's motors. During can changing, the sliver breaks precisely at this thin place. Thus, the maintenance intensive mechanical parts are replaced by an intelligent, maintenance-free, electronic solution here as well.

Optimum sliver coiling geometry for optimised running behaviour

Optimum sliver coiling geometry plays an important role in the trouble-free processing of the sliver during the following stage. Stepless adjustment is possible at the Trützschler draw frames as the rotary can plate is equipped with a separate, adjustable drive.

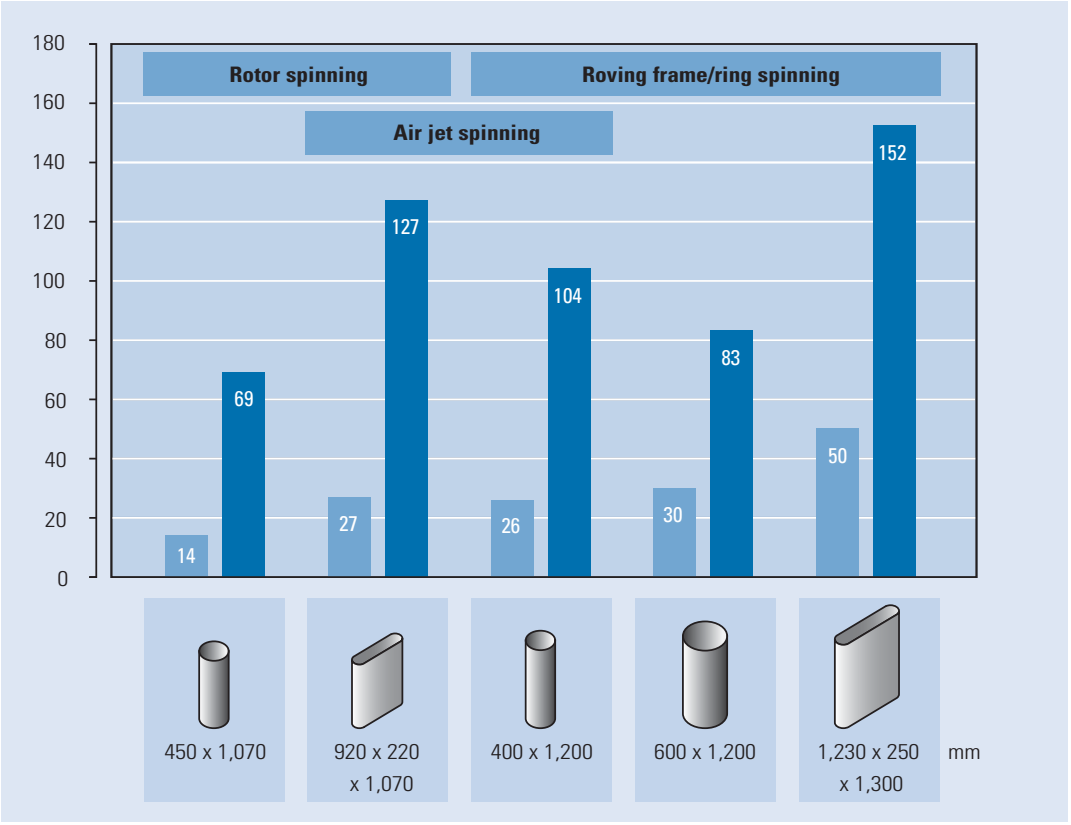
Optimum shape:
Rectangular cans ensure increased economic efficiency

The use of rectangular cans instead of round cans is particularly suited for ring and rotor spinning mills. Thus, Trützschler rectangular cans hold over 50 % more material than comparable round cans. This means 50 % fewer cans, 50 % fewer can transports, 50 % fewer pieced-up sliver sections at the rotor spinning machine or the roving frame, and higher efficiency in the spinning mill.

More filling weight due to an active can bottom control

Rectangular can changers at the auto leveller Draw Frame TD 03 reach a particularly high filling volume of cans since they feature an active can bottom control. When can filling commences, the can bottom is raised just below the revolving coiler plate. During the filling process, the bottom is lowered after each layer by a precisely calculated amount via computer control. Thus, the sliver depositing pressure remains constant from the first to the last layer, and reaches a higher filling volume than with spring loaded can bottoms. The filling level is also significantly above that of other rectangular can systems. Adaptation to various materials and filling weights can be effected via software input – in contrast to conventional cans, an exchange of springs is no longer required.

Active lifting bottom control



Rectangular cans hold about twice as much draw frame sliver as comparable round cans

Can transport – as individual as the respective production

Can transport on pallets

Can transport using a vehicle

Fully automatic can transport

The can changer takes the draw frame can which has just been filled, and puts it into the can magazine. After that, an empty can is supplied to the draw frame from the can magazine. The can magazine provides a total of 13 positions for full and empty cans. Supply or disposal can be performed by automatic or manually controlled transport vehicles.
The rectangular can changer also works without a mechanical linking to the draw frame, and the corresponding angular gears. The drive itself takes place via maintenance-free, digitally controlled servo motors. The rectangular can changer – same as the round can changer – is equipped with reliable automatic sliver separation and stepless adjustment for the coiling geometry.

Manual, semi-automatic or fully automatic?

Automatic can transport is no prerequisite to benefit from the economic advantages of rectangular cans. Three different concepts have been proven in practice:

Manual can transport

In this case, four or six rectangular cans are transported from the can buffer of the draw frame to the rotor spinning machine on a simple pallet. This method is economically efficient and particularly suited when changing a can group at the spinning machine. A transport of rectangular cans is also possible on simple can carriages.

Semi-automatic can transport

In this solution, a freely controlled vehicle is driven back and forth between draw frames and rotor spinning machines. In doing so, it transports up to six full or empty cans at a time. This method has been designed for medium-size installations and flying can changes.

Automatic can transport

In this case, an automatic guided vehicle takes the cans from the can buffer of the draw frame and transports them to the can positions of the rotor spinning machine or to the creel of the roving frame. There they are automatically exchanged against an empty can.

Technical data

Concept with numerous variants

The concept of Trützschler draw frames offers a number of variants. The size of feed can and delivery can differs in terms of diameter and height. The max. diameter is 1,000 mm, and die max. height 1,500 mm. The listed drawings show a selection of most common arrangement variants with differing can formats.

Draw frames without levelling

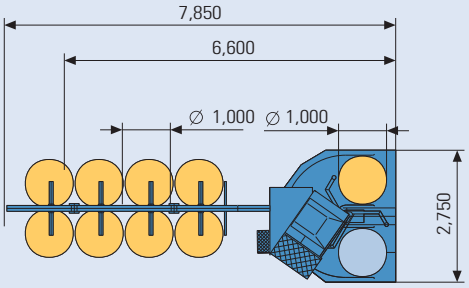


Fig. 9: TD 02

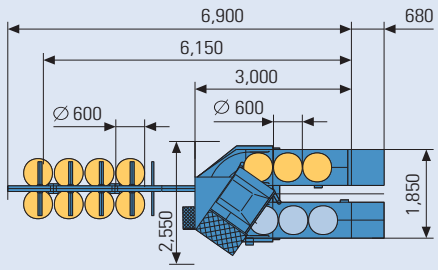


Fig. 10: TD 02

Fig.	Feed cans	Delivery cans
	∅ mm	∅ mm
1	1,000	400
2	1,000	450
3	600	500
4	600	600
5	1,000	1,000
6	600	220 x 920 x 1,075
7	1,000	220 x 920 x 1,075
8	1,000	250 x 1,230 x 1,300
9	1,000	1,000
10	600	600

Levelling draw frames

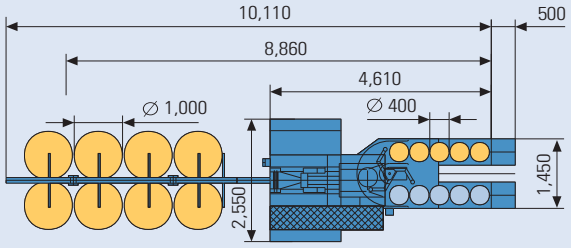


Fig. 1: TD 03 + TD 03-600

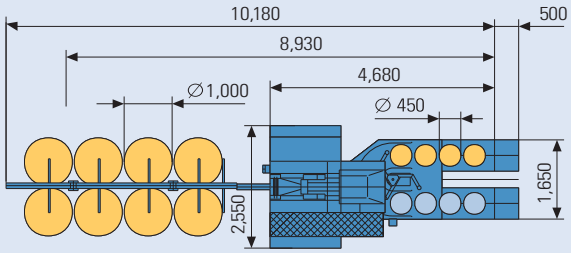


Fig. 2: TD 03 + TD 03-600

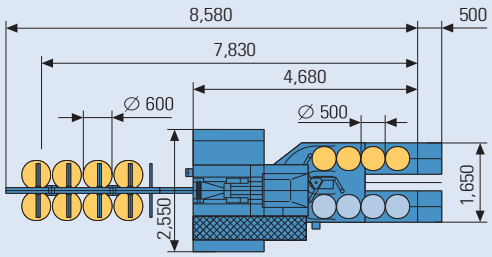


Fig. 3: TD 03 + TD 03-600

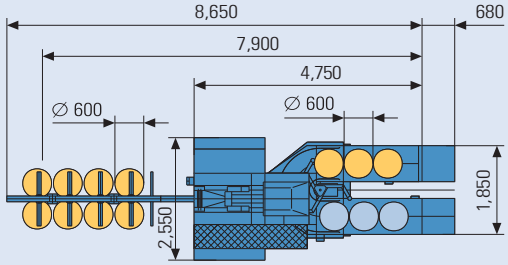


Fig. 4: TD 03 + TD 03-600

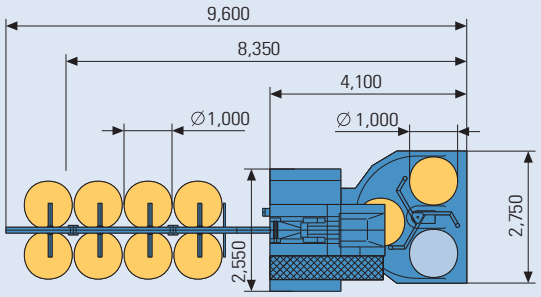


Fig. 5: TD 03

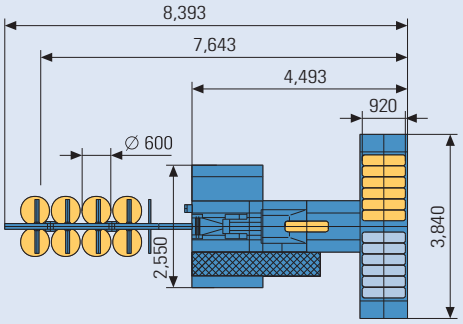


Fig. 6: TD 03 – Rectangular cans for OE rotor spinning

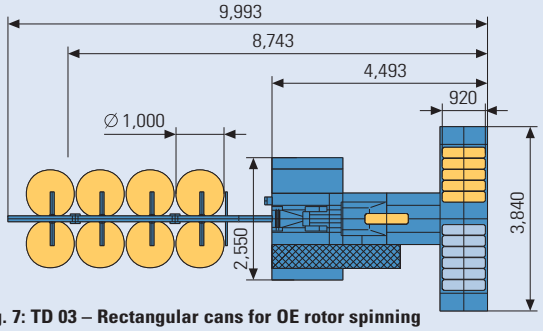


Fig. 7: TD 03 – Rectangular cans for OE rotor spinning and air-jet machines

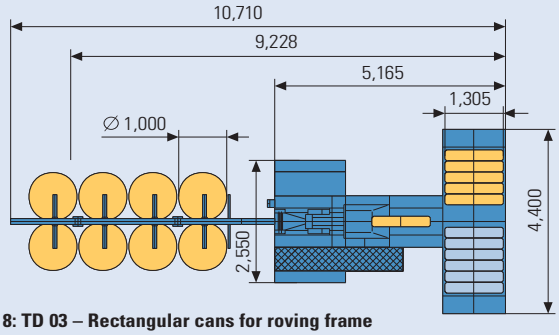


Fig. 8: TD 03 – Rectangular cans for roving frame

Technical data

Models:
TD 02: Single-delivery draw frame without levelling, up to 1,000 m/min delivery speed
TD 03: Single delivery draw frame with levelling, up to 1,000 m/min delivery speed
TD 03-600: Single delivery draw frame with levelling, up to 600 m/min delivery speed

Feeding:
Feed creel or power creel, 6- or 8-fold doubling

Material:
Fibres up to approx. 60 mm

Material feed:
15–50 ktex (g/m)

Draft:
TD 02: 4.5 – 10-fold
TD 03: 4 – 11-fold

Drafting system:
4-over-3 with adjustable pressure bar, pneumatic load of top rolls, integrated suction, quick adjustment of draft zone widths

Can changer

Model/machine		Format	Height	Electric power	
				installed	consumed
Round cans	TD 02 + TD 03 + TD 03-600	400 – 600 mm ∅	1,050 – 1,500 mm	1.1 kW	0.65 kW
	TD 02 + TD 03	900 – 1,000 mm ∅		0.78 kW	0.4 kW
Rectangular cans	TD 03	920 × 220 mm	1,075 mm	3.45 kW	2.45 kW
		1,230 × 250 mm	1,300 mm	4.78 kW	3.4 kW

Installed draw frame power

TD 02		6.3 kW
TD 03	without AUTO DRAFT	9.9 kW
	with AUTO DRAFT	11.6 kW
TD 03-600	without AUTO DRAFT	7.0 kW
	with AUTO DRAFT	8.7 kW

Consumed draw frame power:
0.020 – 0.030 kWh per kg draw frame sliver

Suction:
Continuous 800 m^3/h (–380 Pa) or integrated filter with 0.9 kW installed power

Equipment and options

TD 02		TD 03 + TD 03-600		
Series	Option	Series	Option	
•	–	•	–	Function-oriented overall design for good accessibility to all assembly groups of the machine
•	–	•	–	Maintenance-free, power-saving, highly dynamic digital servo drives
–	–	•	–	Individual drives for stepless adjustment of delivery speed, sliver count and draft at leveller draw frames
•	–	–	–	Infinitely variable delivery speed on draw frame without auto levelling
•	–	•	–	Wide 4-over-3 drafting system with pressure bar
•	–	•	–	Pneumatic load separately controllable for each top roll
•	–	•	–	Quick relief and active lifting of the 4th top roll during standstill
•	–	•	–	Reliable computer control with touch screen for extensive information for operator and maintenance specialists
•	–	•	–	Automatic can changer with sliver separation unit for cans up to 1,000 mm diameter and 1,500 mm height
–	•	–	•	For cans up to 500 mm diameter, optional delivery unit for can carriage
•	–	•	–	Central suction of exhaust air with pressure monitoring, above or below floor
–	–	•	–	SERVO DRAFT short-term leveller
–	–	•	–	SLIVER FOCUS automatic sliver count control
–	–	•	–	Integrated quality monitoring with regard to sliver count, sliver evenness, spectrogram and thick places in the sliver, online spectrogram analysis
–	•	–	•	Filter Box TD-FB with fan, large filter surface and high-volume collecting container
–	•	–	•	Power Creel TD-PC for up to 8-fold doubling
•	–	•	–	Rake-type sliver feed, double-row, for up to 8-fold doubling
–	–	–	•[1)]	Optimisation Set TD-OS – Digital servo drive for centre drafting system cylinder for stepless adjustment of break draft – Software AUTO DRAFT for automatic optimisation of break draft
–	–	–	•[1)]	Automatic rectangular can changer with sliver separation unit and can magazine for rectangular cans

[1)] For TD 03 only

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- Blending
- Cleaning/Opening
- Foreign Matter Separation
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