Erhardt+Leimer

ELGUIDER

Web guiding systems

Continuous acquisition and control of the web position

ELNET

Contents

*** in preparation**

FOCUS ON CUSTOMER SATISFACTION

INTELLIGENT TECHNOLOGY · SMART PRODUCTS

INTERNATIONAL LOCATION · WORLDWIDE AVAILABILITY

CUTTING-EDGE TECHNOLOGY –
AT HOME ALL OVER THE WORLD

Erhardt+Leimer
Global solutions for production of the future

Intelligent technologies and products in the highest quality designed to optimize the production processes of our customers all around the world. This is our claim as the internationally expanding Erhardt+Leimer group of companies.

With our global presence – from development to production and on to service – we are always close to the customer. We develop customer-specific solutions and provide our customers with excellent products either in analog or digital versions depending on their preference. Not only this, but we also set new standards for the production of tomorrow. In the process, it is not just our products that are increasingly becoming digital – our entire company is currently undergoing a digital transformation. One visible indication of this is the E+L online shop, which enables our customers to order products and spare parts quickly and easily from our website.

With more than 1,600 employees at sites across Europe, Asia, and America we deliver cutting-edge technology on-time to any location in the world.

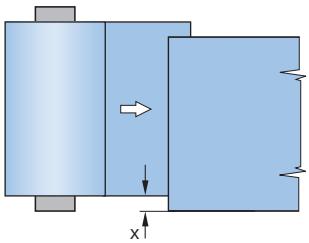
In everything we do, we aim to use all company resources responsibly to protect the environment and demonstrate our commitment to increased sustainability.

Web guiding systems for improved quality and productivity

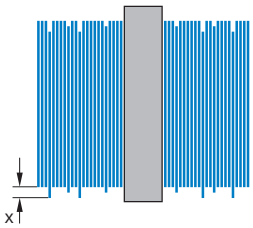
Today, the manufacturers and users of machines for processing web-type materials are confronted with ever increasing demands: Production processes should be even faster, while at the same time performed with greater precision, the quality of the finished product further improved while personnel, waste and, above all, downtimes, should be reduced to a minimum.

A decisive contribution to the fulfillment of these prerequisites is made by web guiding systems. Typically, web-type materials are fed from a coil to the machine, finished and then rewound. During these stages, various position errors may occur, examples of which are illustrated on this page. E+L web guiding systems are designed to eliminate these sources of errors and to ensure permanent, precise web alignment and winding. Depending on the type of material, application and task, Erhardt+Leimer offers a wide variety of systems with the latest networking technology: for decisively more quality and productivity that pays off!

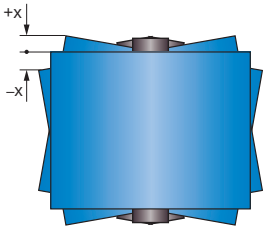
Typical position errors



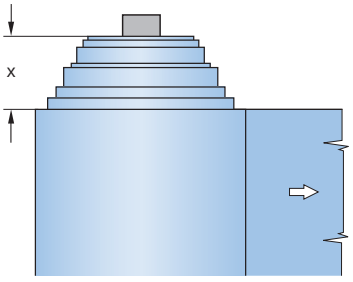
Web offset on roll change



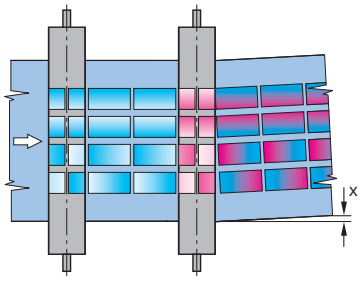
Incorrectly wound rolls



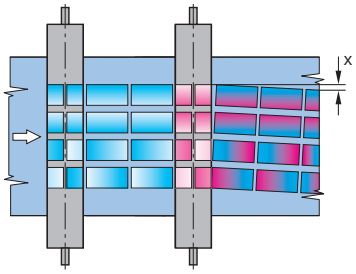
Tumbling errors



Telescoped rolls



Lateral web movement in the process

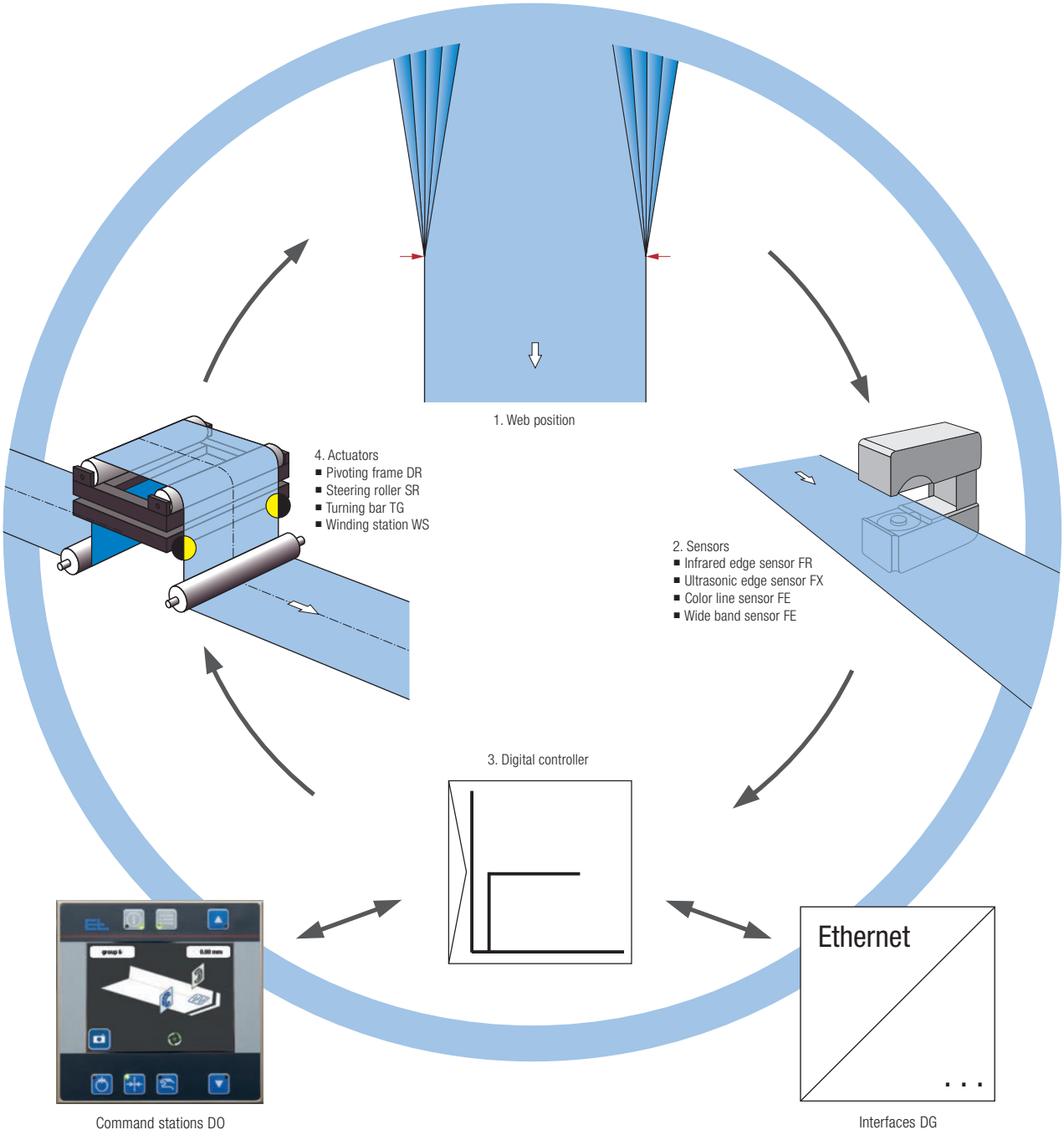


Printed image travel

Control loop

Any automation of a controller is based on the principle of a simple control loop. Even the most complex of tasks may be reduced to this control loop.

1. The starting point is the current web position.
2. A sensor detects the actual position of the web without contact. Depending on the task and material properties, this may be an infra-red, ultrasonic or line sensor.
3. The controller compares the actual position of the web with the pre-defined target value and sends a corresponding correction signal to the actuator.
4. The actuator corrects the web travel. Depending on the application and the material type, the actuator may be a pivoting frame, a steering roller, a turning bar or a linear drive for a reel station.



Advantages of the EL.NET system

Do you want to increase your productivity, improve your quality and reduce downtimes to a minimum? Your requirements are our motivation to deliver the perfect solution. And what is more: we create the basis for the end-to-end automation of your entire production process and with it significantly higher quality and productivity that pays off!

With EL.NET we provide you with the tools for Industry 4.0 processes. In our EL.NET control system, digital E+L components connect together consistently in a network and in this way make possible straightforward, quick integration in to the customer's network. All devices automatically and specifically exchange data relevant for optimal control within a production plant.
With EL.NET it is possible to connect together in a network up to 255 guiding systems. The data acquired at all levels of the production process make up a decisive part of the automation. They create a high degree of transparency and make it possible to monitor and to optimize processes in realtime and in this way to minimize downtimes and production scrap.

Each EL.NET device is equipped with an integrated web server via which it makes its data and functions available. As such, user-friendly, prompted commissioning, optimization and service are possible via web-based management, i.e. using any standard web browser without the need for special software. EL.NET components include our digital edge and color line sensors, controllers and brushless, and thus wear-free, actuating drives. The wiring and supply of power to the devices are straightforward; commissioning is quick and trouble-free using plug & play.

The components flexibly adapt to new requirements, minimize retooling times and guarantee efficient production. Straightforward connection of the E+L guiding systems to a customer controller is possible via integrated fieldbus interfaces and fieldbus modules.

Digital system

- Continuous, digital web guiding system
- No drift caused by analog signals
- No analog transmission paths

Web-based management

- Commissioning and service with every standard browser
- No firmware (special software) required
- User-friendly display of the configuration

Ethernet networking

- Maximum 255 participants
- Increased data rate of up to 100 Mbit/s
- Self-organizing system

Brush-less drive technology

- Rotor with lowest mass inertia - Increased dynamics
- Wear-free
- Fault-resistant

Absolute position detection

- Absolute actuator position is always available - no reference run required
- No reference sensor
- No position loss on power off

Controller and output stage integrated into the actuator/actuating drive

- Space saving
- Minimized wiring effort

Self-healing

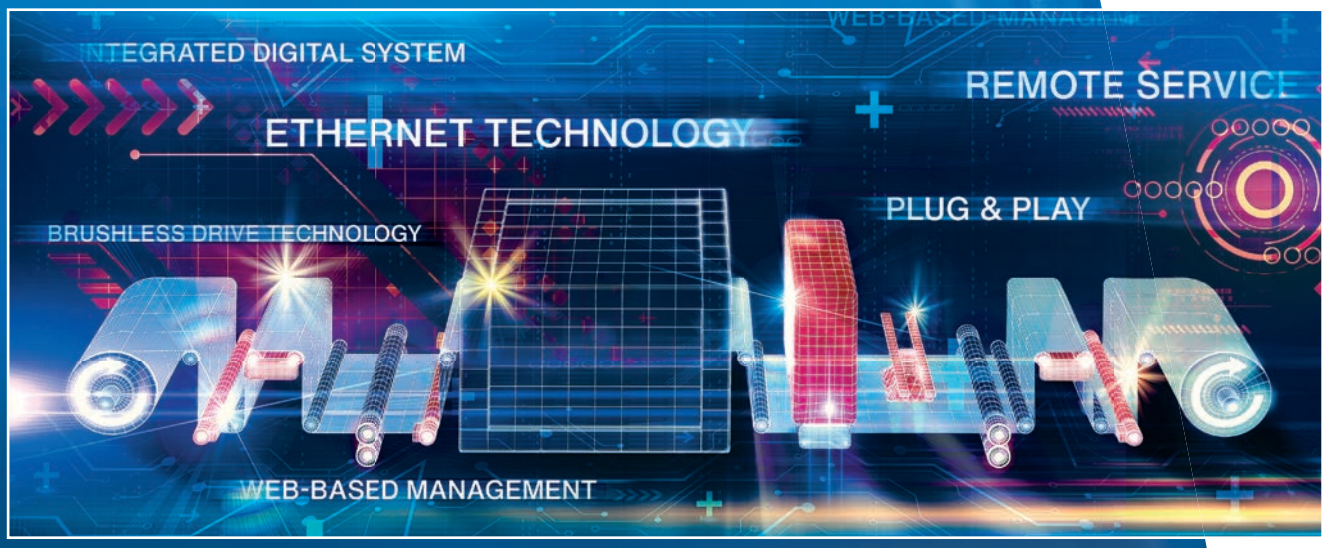
- Automatic configuration recovery for problem-free replacement of control components

Certifications

- Certified for USA and Canada

#STARTSMART WITH ETNET

JOINT THE PRODUCTION OF THE FUTURE!



WE OPTIMIZE PRODUCTION PROCESSES IN THE FOLLOWING INDUSTRIES

Labels | Printing | Plastic | Converting | Packaging | Beverages | Hygiene | Energy & electronics

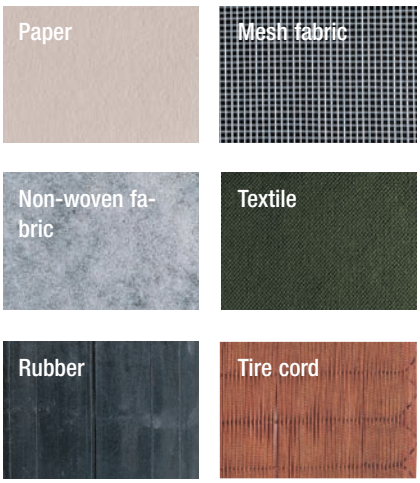
FR 46 infrared edge sensor

FR 46 infrared edge sensor

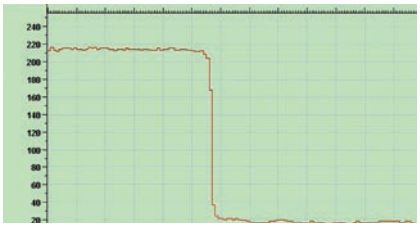
- Compact infrared transmitted light sensor
- Measuring range ±2.5 mm with a resolution of 0.01 mm
- Acquisition of edges and threads
- Scanning with CCD array guarantees a stable operating point independent of the material transparency
- Exposure controller for the compensation of soiling
- Integrated air purge system for extreme dust loads
- Bar display for the indication of the current edge position or diagnostic information

FR 46 infrared edge sensor

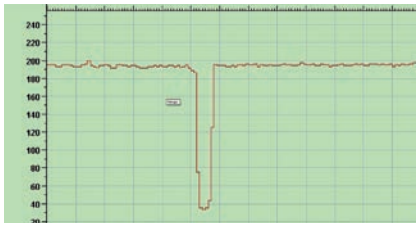
Material sample



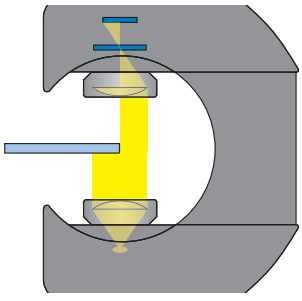
Scan, edge scanning



Scan, thread scanning



Infrared edge sensor FR 46 on non-woven fabric edge



Principle of operation FR 46

Technical Data

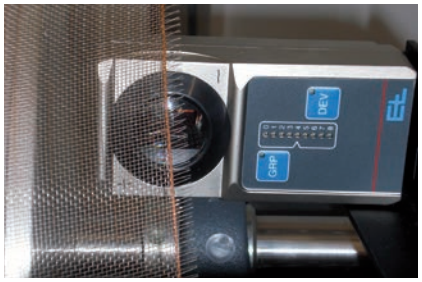
FR 46 infrared edge sensor	
Operating voltage Nominal value Nominal range (ripple included)	 24 V DC 20 to 30 V DC
Current consumption	50 mA DC
Ambient temperature	+10 to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Measuring range	±2.5 mm
Resolution	0.01 mm
Linearity	±0.2 mm
Wavelength	880 nm
Scanning rate	200 Hz
Cable length	max. 10 m
Protection class	IP 54
Weight	0.2 kg
Air purge system operating pressure	Min. 0.1 bar; max. 0.2 bar
Service unit filter	5 µm
Service unit residual oil content	< 0.01 mg/m³
Fork width	30 mm
Dimensions (L x W x H)	77 x 27 x 93 mm
Certification	CE conformity

FR 52 infrared edge sensor

FR 52 infrared edge sensor

- Infrared edge sensor based on the principle of retroreflection
- Measuring range ±10 mm with a resolution of 0.02 mm
- Distance-independent edge evaluation based on parallel light beams
- Acquisition of edges and threads
- Scanning with CCD array guarantees a stable operating point independent of the material transparency
- Exposure controller for the compensation of soiling
- Optional integrated air purge system for extreme dust conditions
- Bar display for the indication of the current edge position or diagnostic information

FR 52 infrared edge sensor

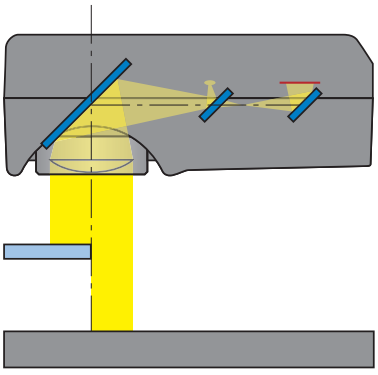


Infrared edge sensor FR 52 for mesh fabric acquisition

FR 52 with reflector bar

Selection table

Reflector bar	
Type	Fork width (mm)
FR_5000-10567058	30
FR_5000-10504621	75
FR_5000-10500259	160



Principle of operation FR 52

Technical Data

FR 52 infrared edge sensor	
Operating voltage Nominal value Nominal range (ripple included)	 24 V DC 20 to 30 V DC
Current consumption	80 mA DC
Ambient temperature	+10 to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Measuring range	±10 mm
Resolution	0,02 mm
Linearity	±0.1 mm
Wavelength	850 nm
Scanning rate	200 Hz
Cable length	max. 10 m
Protection class	IP 54
Weight	0.3 kg
Air purge system operating pressure	Min. 0.1 bar; max. 0.2 bar
Service unit filter	5 µm
Service unit residual oil content	< 0.01 mg/m³
Fork width	See selection table
Dimensions (L x W x H)	105 x 50 x 40 mm
Certification	CE conformity

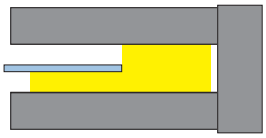
FR 61/62 infrared wide band sensor

FR 61/62 infrared wide band sensor

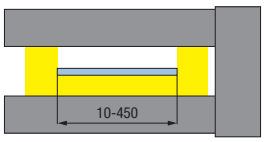
- Infrared wide band sensor with large measuring range of 160 mm, 320 mm or 480 mm
- Electronic web offset in the sensor field of view without manual adjustment of the sensor
- Scanning of homogeneous materials such as paper, non-woven fabric, woven and knitted fabrics up to a transparency of 70 %
- Simultaneous evaluation of up to four edges
- Insensitive to soiling through integrated exposure controller and incidental light compensation
- Stable operating point independent of the material transparency
- Optionally with air purge system for extreme dust conditions

FR 61/62 infrared wide band sensor

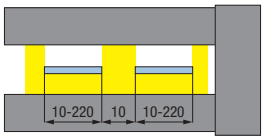
Edge configurations



- Acquisition and evaluation of one web edge

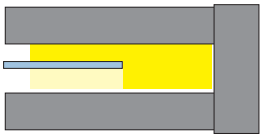


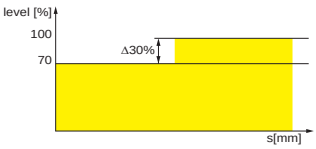
- Acquisition and evaluation of two web edges
- Application for webs from 10 to 450 mm



- Acquisition and evaluation of four web edges
- Application for two webs from 10 to 220 mm

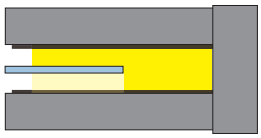
Edge acquisition on transparent webs

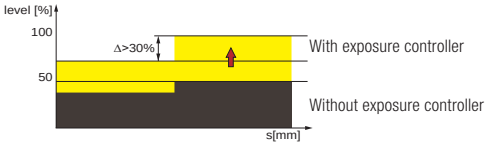




- Reliable edge detection at max. 70 % transparency of the material webs

Edge acquisition on transparent webs in case of soiling





- Integrated exposure controller ensures constant light intensity even in case of soiling
- Reliable acquisition of transparent webs even if there are heavy dust deposits

EL.NET
Fast
order change

Selection table

Type with PoE	Type with Sensor CAN	Measuring range (mm)	Fork width (mm)	Air purge system
FR 6101	FR 6201	160 (+/-80)	40	With
FR 6102	FR 6202	320 (+/-160)	40	With
FR 6103	FR 6203	480 (+/-240)	40	With
FR 6105	FR 6205	160 (+/-80)	104	With
FR 6106	FR 6206	320 (+/-160)	104	With
FR 6107	FR 6207	480 (+/-240)	104	With
FR 6111	FR 6211	160 (+/-80)	40	Without
FR 6112	FR 6212	320 (+/-160)	40	Without
FR 6113	FR 6213	480 (+/-240)	40	Without
FR 6115	FR 6215	160 (+/-80)	104	Without
FR 6116	FR 6216	320 (+/-160)	104	Without
FR 6117	FR 6217	480 (+/-240)	104	Without

Technical Data

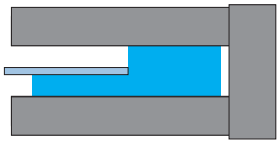
	Infrared wide band sensor FR 61	Infrared wide band sensor FR 62
Interface	Ethernet PoE (Power over Ethernet)	Sensor CAN
Operating voltage, nominal value	48 V DC	24 V DC
Electrical connection	M 8 socket connector 4-pin D-encoded	M 8 socket connector 6-pin
Cable length	Max. 100 m	Max. 10 m
Resolution	0.001 mm	0.01 mm
Measuring range	±80 / ±160 / ±240 mm	
Fork width CW	40 / 104 mm	
Linearity	Fork width 40 mm: +/-0.3 mm (measuring range 160/320 mm) +/-0.4 mm (measuring range 480 mm) Fork width 100 mm: +/-0.4 mm (measuring range 160/320 mm) +/-0.5 mm (measuring range 480 mm)	
Reproducibility	±0.1 mm	
Wavelength	850 nm	
Scanning rate	200 Hz (5 ms) to 500 Hz (≤ 2 ms)	
Evaluation, edge number	Max. 4 edges (2 webs)	
Commissioning / Configuration	Using web-based management	
Current consumption	75 mA	150 mA
Fieldbuses	Ethernet UDP, Ethernet/IP, ProfiNet	
Air purge system operating pressure	2 bar	
Air purge system air consumption	1.55 m³/h (at 2 bar and measuring range 160 mm)	
Service unit filter	5 µm	
Service unit residual oil content	< 0.01 mg/m³	
Pneumatic connection	Plastic hose, external diameter 6 mm, externally calibrated	
Ambient temperature	+10 °C to +50 °C	
Temperature drift	≤ ±0.1 mm/10 K	
Storage temperature	-10 °C to +80 °C	
Relative humidity	15 to 95 % (non-condensing)	
Protection class	IP 54	
Measuring range / dimensions (L x W x H)	±80 mm CW 40 mm / 230 x 110 x 32 mm ±160 mm CW 40 mm / 390 x 110 x 32 mm ±240 mm CW 40 mm / 550 x 110 x 32 mm ±80 mm CW 100 mm / 230 x 174 x 32 mm ±160 mm CW 100 mm / 390 x 174 x 32 mm ±240 mm CW 100 mm / 550 x 174 x 32 mm	
Certification	CE conformity	

Blue light wide band sensor FR 65/66*

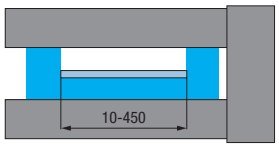
Blue light wide band sensor FR 65/66

- Blue light transmitted light sensor with large measuring range of 160 / 320 and 480 mm
- Electronic web offset in the sensor field of view without manual adjustment of the sensor
- Scanning of homogeneous, highly-transparent film webs
- Simultaneous evaluation of up to four edges
- Insensitive to soiling due to integrated exposure controller and incident light compensation
- Stable operating point independent of the material transparency

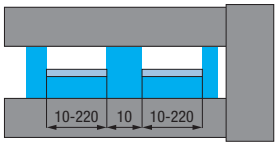
Edge configurations



- Acquisition and evaluation of one web edge

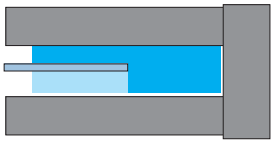


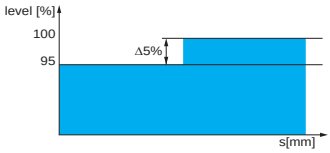
- Acquisition and evaluation of two web edges
- Application for webs from 10 to 450 mm



- Acquisition and evaluation of four web edges
- Application for two webs from 10 to 220 mm

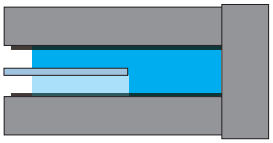
Edge acquisition on transparent webs

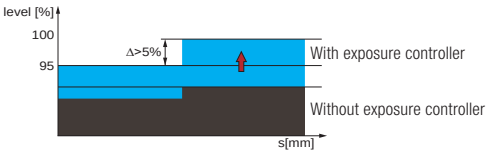




- Reliable edge detection at max. 95 % transparency of the material webs

Edge acquisition on transparent webs in case of soiling





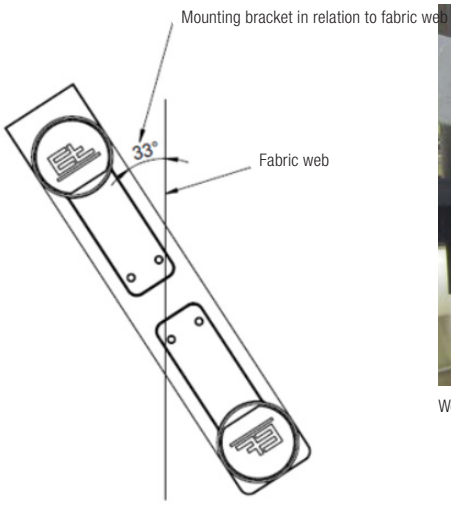
- Integrated exposure controller ensures constant light intensity even in case of soiling
- Reliable acquisition of transparent webs even if there are heavy dust deposits

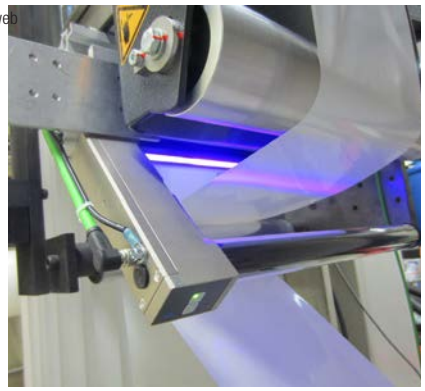
NEW
Detects highly transparent webs

* in preparation

Application

- To detect transparent fabric webs, the sensor must be mounted at an angle of 33° to the material web





Web center detection of film with blue light wide band sensor FR 65

Selection table

Type with PoE	Type with Sensor CAN	Measuring range (mm)	Fork width (mm)	Air purge system
FR 6515	FR 6615	160 (+/-80)	104	Without
FR 6516	FR 6616	320 (+/-160)	104	Without
FR 6517	FR 6617	480 (+/-240)	104	Without

Technical Data

	Infrared wide band sensor FR 65	Infrared wide band sensor FR 66
Interface	Ethernet PoE (Power over Ethernet)	Sensor CAN
Operating voltage, nominal value	48 V DC	24 V DC
Electrical connection	M 8 socket connector 4-pin D-encoded	M 8 socket connector 6-pin
Cable length	Max. 100 m	Max. 10 m
Resolution	0.001 mm	0.01 mm
Measuring range	±80 / ±160 / ±240 mm	
Fork width CW	104 mm	
Linearity	+/-0.4 mm (measuring range 160/320 mm) +/-0.5 mm (measuring range 480 mm)	
Reproducibility	±0.1 mm	
Wavelength	470 nm	
Scanning rate	200 Hz (5 ms) to 500 Hz (≤ 2 ms)	
Evaluation, edge number	Max. 4 edges (2 webs)	
Commissioning / Configuration	Using web-based management	
Current consumption	75 mA	150 mA
Fieldbuses	Ethernet UDP, Ethernet/IP, ProfiNet	
Ambient temperature	+10 °C to +50 °C	
Temperature drift	≤ ±0.1 mm/10 K	
Storage temperature	-10 °C to +80 °C	
Relative humidity	15 to 95 % (non-condensing)	
Protection class	IP 54	
Measuring range / dimensions (L x W x H)	±80 mm CW 100 mm / 230 x 174 x 32 mm ±160 mm CW 100 mm / 390 x 174 x 32 mm ±240 mm CW 100 mm / 550 x 174 x 32 mm	
Certification	CE conformity	

FE 45 infrared wide band sensor

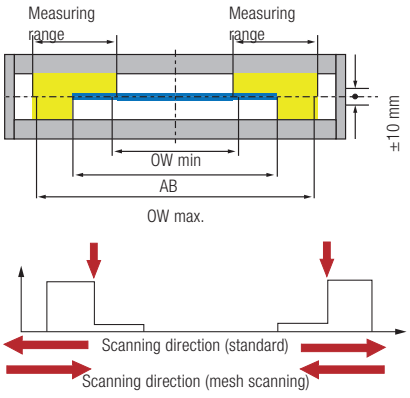
- Digital wide band sensor for web center, web edge acquisition and width measurement up to a maximum operating width of 3800 mm (special widths up to 5000 mm)
- Reliable scanning principle with infrared light
- High immunity to transparency fluctuations and external light
- Protective tubes made of Plexiglas for dry and damp operation and made of glass for wet areas

FE 45 infrared wide band sensor

Selection table

For dry and damp environment		
Type	Resolution	Material
FE 4511	±5 mm	Plexiglas
FE 4521	±3 mm	Plexiglas
FE 4531	±1 mm	Plexiglas
For wet environment		
Type	Resolution	Material
FE 4513	±5 mm	Glass
FE 4523	±3 mm	Glass
FE 4533	±1 mm	Glass

Principle of operation FE 45



Technical Data

FE 45 infrared wide band sensor			
		Web edge	Web center
Measuring range	Standard High Premium	Max. 1700 mm Max. 1700 mm Max. 900 mm	Max. 3400 mm Max. 3400 mm Max. 1800 mm
Operating width		Min. 400 mm Max. 3800 mm Special design up to 5000 mm	
Clear width	Plexiglas Glass	80 mm 75 mm	
Resolution	Standard High Premium	±5 mm ±3 mm ±1 mm	
Width measurement accuracy	Standard High Premium	±10 mm ±6 mm ±2 mm	
Web position (height fluctuation)		Max. ±10 mm around the sensor center axis	
Operating voltage	Nominal value Nominal range	24 V DC 20 to 30 V DC (ripple included)	
Current consumption		200 mA	
Wavelength		850 nm	
Scanning rate		200 Hz	
Length of sensor cable		25 m	
Interface		Sensor CAN, protocol 2.0/M16	
Ambient temperature		+10 to +60 °C	
Storage temperature		0 to +85 °C	
Air humidity		15 to 95 % (non-condensing)	
Protection class		IP 54	
Weight Premium		Approx. 15 kg (AB 1600 mm) Approx. 30 kg (AB 3200 mm)	
Certification		CE conformity	

FE 46 infrared wide band sensor

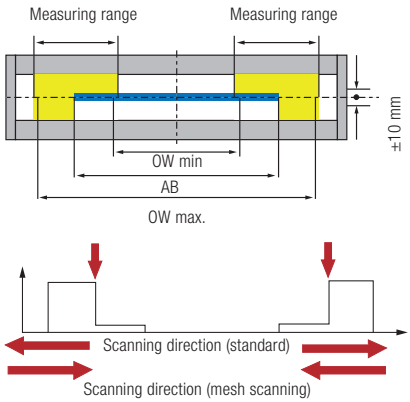
- Digital wide band sensor for web center, web edge acquisition and width measurement up to a maximum operating width of 3800 mm (special widths up to 5000 mm)
- Reliable scanning principle with infrared light
- High immunity to transparency fluctuations and external light
- Protective tubes made of Plexiglas for dry and damp operation and made of glass for wet areas

FE 46 infrared wide band sensor

Selection table

For dry and damp environment		
Type	Material	frame
FE 4631	Plexiglas	cannot be separated
FE 4635	Plexiglas	can be separated
For wet environment		
Type	Material	frame
FE 4633	Glass	cannot be separated
FE 4636	Glass	can be separated

Principle of operation FE 46



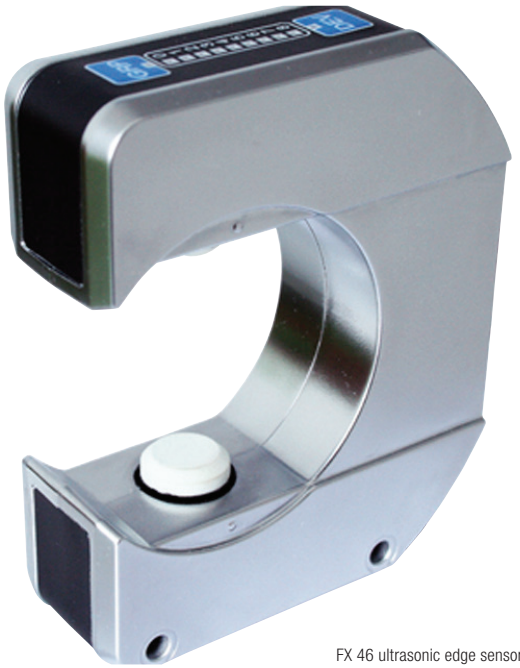
Technical Data

FE 46 infrared wide band sensor			
		Web edge	Web center
Measuring range	Premium	Max. 900 mm	Max. 1800 mm
Operating width		Min. 400 mm Max. 3800 mm	
Clear width	Plexiglas Glass	160 mm 155 mm	
Resolution	Premium	±1 mm	
Width measurement accuracy	Premium	±2 mm	
Web position (height fluctuation)		Max. ±10 mm around the sensor center axis	
Operating voltage	Nominal value Nominal range	24 V DC 20 to 30 V DC (ripple included)	
Current consumption		200 mA	
Wavelength		850 nm	
Scanning rate		200 Hz	
Length of sensor cable		25 m	
Interface		Sensor CAN, protocol 2.0/M16	
Ambient temperature		+10 to +60 °C	
Storage temperature		0 to +85 °C	
Air humidity		15 to 95 % (non-condensing)	
Protection class		IP 54	
Weight Premium		Approx. 15 kg (AB 1600 mm) Approx. 30 kg (AB 3200 mm)	
Certification		CE conformity	

FX 46 ultrasonic edge sensor

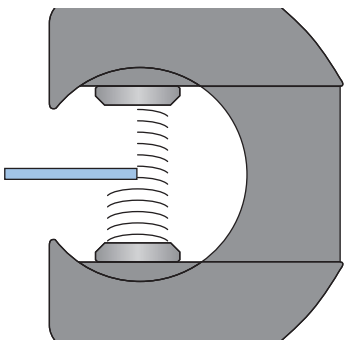
FX 46 ultrasonic edge sensor

- Compact ultrasonic edge sensor with digital evaluation
- Measuring range ±3 mm
- Insensitive to soiling due to dust
- Scanning of materials opaque to sound such as paper, plastic and metal films independent of the material transparency
- Internal temperature compensation for stable operating point
- Bar display for the indication of the actual edge position or diagnostic information



FX 46 ultrasonic edge sensor

Ultrasonic edge sensor FX 46 at paper edge



Principle of operation FX 46

Technical Data

FX 46 ultrasonic edge sensor	
Operating voltage Nominal value Nominal range (ripple included)	 24 V DC 20 to 30 V DC
Current consumption	80 mA DC
Ambient temperature	+10 to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Measuring range	±3 mm
Linearity deviation (measuring range 10 to 90 %)	±1 %
Ultrasonic frequency	~ 200 kHz
Resolution	0,02 mm
Scanning rate	200 Hz
Cable length	max. 10 m
Protection class	IP 54
Installation altitude	0 to 3000 m above sea level
Weight	0.2 kg
Fork width	30 mm
Dimensions (L x W x H)	77 x 27 x 93 mm
Certification	CE conformity

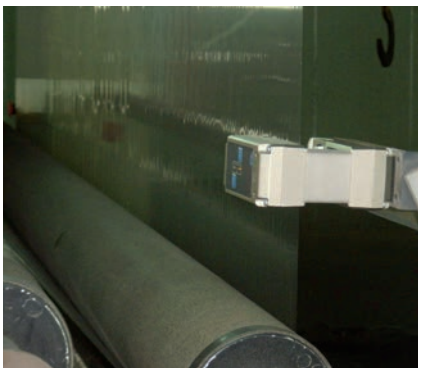
Ultrasonic edge sensor FX 42/FX 52

Ultrasonic edge sensor FX 42/FX 52

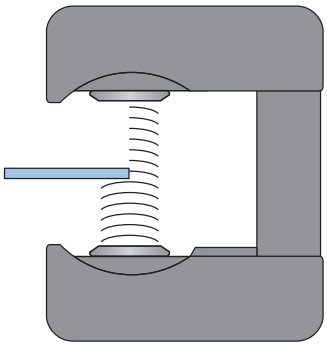
- Ultrasonic edge sensor with digital evaluation
- Field of view ±3 mm or ±10 mm
- Fork widths 30, 60 and 124 mm
- Insensitive to soiling due to dust
- Scanning of materials opaque to sound such as paper, plastic and metal films independent of the material transparency
- Internal temperature compensation for stable operating point
- Bar display for the indication of the actual edge position or diagnostic information

Ultrasonic edge sensor FX 42

Ultrasonic edge sensor FX 52



Ultrasonic edge sensor FX 5 in film manufacturing machine



Principle of operation FX 42

Selection table

Ultrasonic edge sensors FX 4/5		
Type	Measuring range ± (mm)	Fork width LW (mm)
FX 4230	3	30
FX 4260	3	60
FX 4200	3	124
FX 5230	10	30
FX 5260	10	60
FX 5200	10	124

Ultrasonic edge sensor FX 4/5	
Operating voltage Nominal value Nominal range (ripple included)	 24 V DC 20 to 30 V DC
Current consumption	80 mA DC
Ambient temperature	+10 to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Measuring range	See selection table
Linearity deviation (measuring range 10 to 90 %)	±1 %
Ultrasonic frequency	~ 200 kHz
Resolution	0,02 mm
Scanning rate	200 Hz
Cable length	max. 10 m
Protection class	IP 54
Installation altitude	0 to 3000 m above sea level
Weight	0.95 kg
Fork width	See selection table
Dimensions (L x W x H)	105 x 50 x (CW + 80) mm
Certification	CE conformity

FE 52 color line sensor with DO 4021

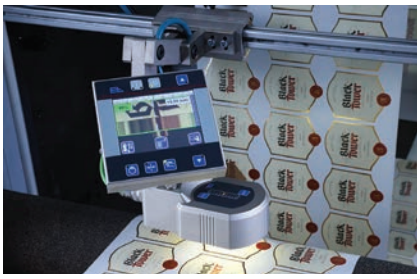
FE 52 color line sensor

- Digital color matrix sensor for the acquisition of color lines and color contrasts
- Exposure controller for the compensation of soiling
- Integrated light source with automatic adaptation to matt and gloss surfaces
- Adjustable search range for hiding interfering contours

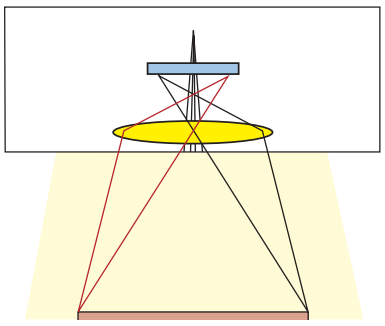
DO 4021 command station

- Intuitive operation with color touch display
- Real 2D depiction of the guiding criterion
- Straightforward teach-in of the guiding reference using color touch display
- Display of scanning quality
- Operation of line sensor and web guider
- Connection on the FE 52 via PoE (Power over Ethernet)

FE 52 color line sensor with DO 4021



Color line sensor FE 52 on roller inspection machine



Principle of operation FE 52

Technical Data

FE 52 color line sensor	
Operating voltage, nominal value	24 V DC (20 to 30 V DC)
Current consumption	300 mA DC
Ambient temperature	+10 to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Measuring range	±10 mm
Field of view	±16 mm
Resolution	0,02 mm
Distance sensor – web	28 mm, ±1 mm
Interface	Sensor CAN Ethernet PoE to command station DO 4021
Scanning rate	200 Hz
Cable length to the controller	max. 10 m
Protection class	IP 54
Weight	0.75 kg
Dimensions (L x W x H)	140 x 78.5 x 54 mm
Certification	CE conformity

DO 4021 command station	
Operating voltage	Is supplied with power by the color line sensor FE 52 via PoE (Power over Ethernet) (48 VDC)
Current consumption	200 mA DC
Ambient temperature	+10 to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Display resolution	320 x 240 pixels
Interface	Ethernet PoE
Length of cable to FE 52	Max. 30 m
Protection class	IP 54
Weight	0.5 kg
Dimensions (L x W x H)	100 x 100 x 34 mm
Certification	CE conformity

Guiding criteria

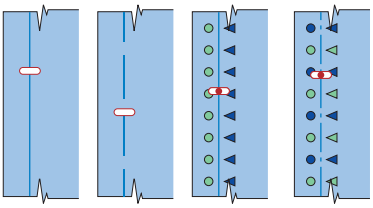
- Line scanning, light line on dark background
- Line scanning, dark line on light background
- Contrast scanning

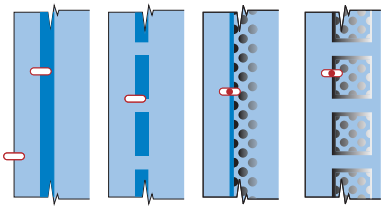
Line scanning

- Continuous line with even background
- Broken line with even background
- Continuous line with uneven background
- Broken line with uneven background
- Line width 0.5 to 8 mm (nominal width 2 to 3 mm)
- Background width on both sides minimum 1 mm
- Field of view can be restricted to double line width

Contrast scanning

- Web edge scanning
- Contrast edge with even background
- Broken contrast edge with even background
- Contrast edge with uneven background
- Broken contrasting edge with uneven background
- Color contrast edge on both sides minimum 1 mm
- Field of view can be restricted to 2 mm

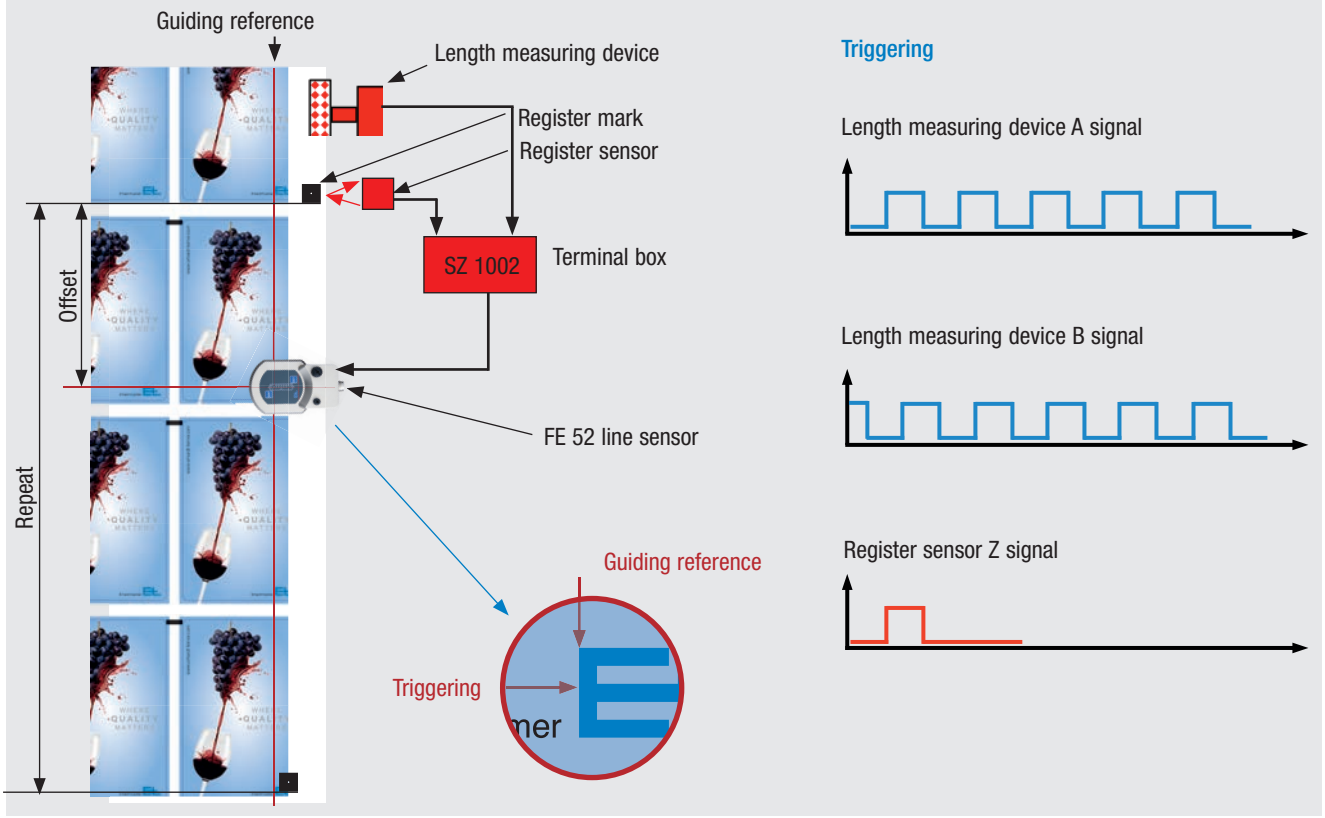




Interrupted guiding reference with triggering

If the pulse-pause ratio for a guiding reference is < 2:1, triggering is necessary.

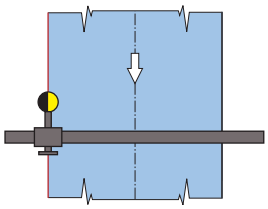
Your benefit: Material saving at the edge, as space for a guiding line not necessary.



Position control methods

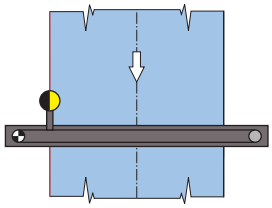
Web guiding is initially defined by the type of web processed. Unfinished fabric webs may only be guided by the edge as no other regular contrasting characteristics are featured. Finished webs offer a further field of possible guiding criteria. They may be controlled by a printed characteristic line, water marks, notching or in addition to the web edge, by a freely selected contrast.

Manual sensor positioning
Web edge guiding



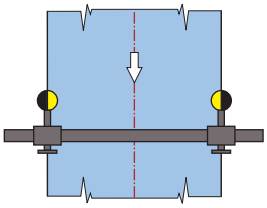
Guiding by left or right web edge

Motorized sensor positioning
Web edge guiding



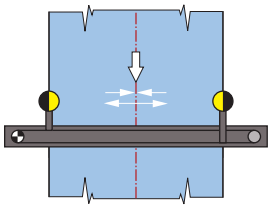
Guiding by left or right web edge

Manual sensor positioning
Web center guiding

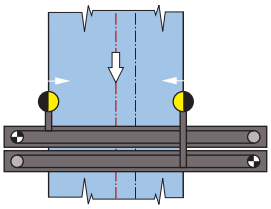


Guiding by the ideal web center line/machine center line

Motorized sensor positioning
Web center guiding

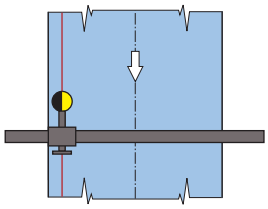


Guiding by the ideal web center line/machine center line with symmetric sensor positioning (hybrid control)



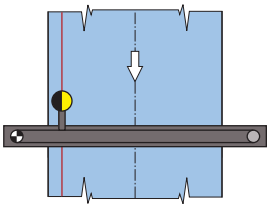
Guiding by the web center which does not correspond to the machine center with motorized sensor positioning for both sides (automatic edge search)

Manual sensor positioning
Web contrast guiding



Guiding by a printed line or existing contrasts

Motorized sensor positioning
Web contrast guiding



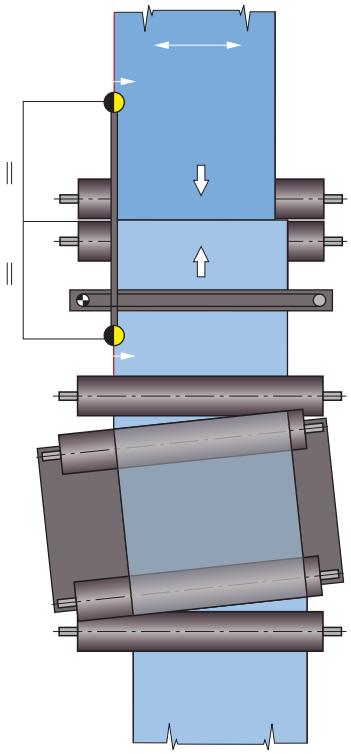
Guiding by a printed line or existing contrasts

Web to web guiding

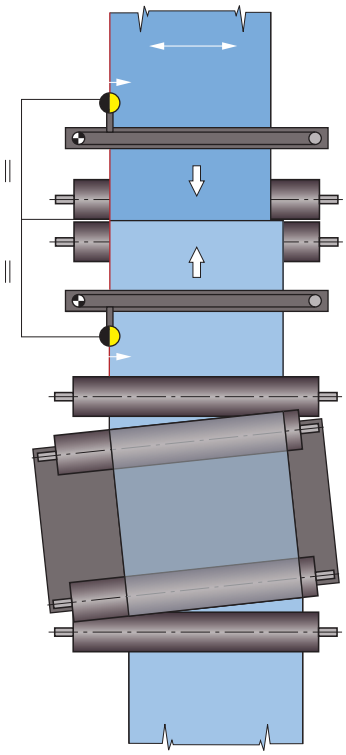
Laminating means combining two or several webs to produce a composite material. All the webs that come together in front of the laminating unit must be positioned exactly in relation to one another.

The more precisely the webs are matched, the more economical the laminating process will be. This applies both to material input and the disposal of trimmings (wastage).

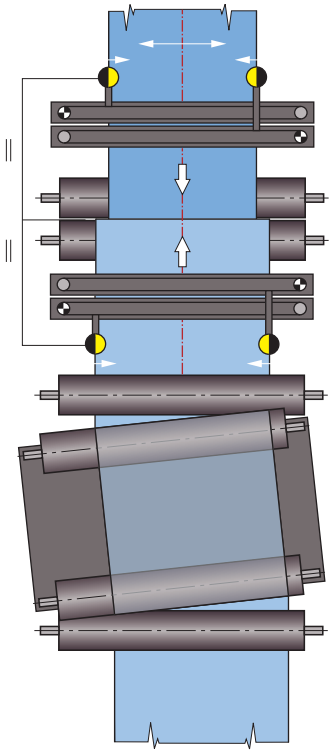
Web to web guiding by the web edge with one support beam



Web to web guiding by the web center line with two support beams



Web to web guiding by the web edge with two support beams



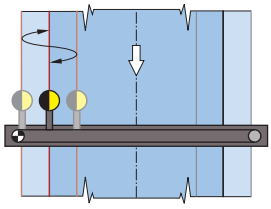
Web oscillation

Oscillation refers to controlled changes in the position of the web following a specific cycle. This cycle can be time-based or length-based.

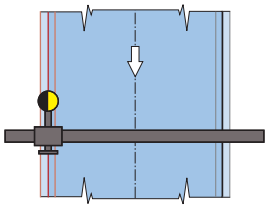
Web oscillation is primarily used for web guiding in front of rewinders.

Web width measurement

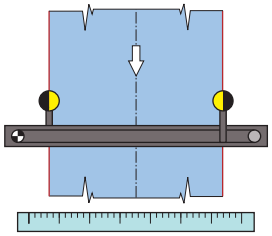
If both web edges are scanned by two sensors, the actual web width may also be calculated and displayed.



For larger oscillation strokes, the mechanical sensor set point is changed using a motor.



For smaller oscillation distances, a change in the electrical set point within the sensor range is sufficient.



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Technology

Sensor positioning VS 80

VS 80 support beam

- Motorized linear sensor positioning for ultrasonic, infrared and color line sensors
- Brush-less drive technology with one or two motors
- Compact design with integrated position controller, output stage and Ethernet switch
- Ethernet connection for easy integration in web guiding systems
- Simple commissioning via web-based management
- Functions such as sensor pre-positioning, edge search, move clear and width measurement possible
- Integrated wiring harness

Support beam VS 80 with data network center

Motorized sensor positioning Support beam VS 8015

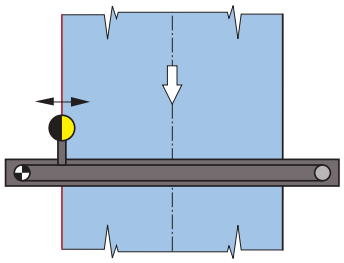
This basic version features a carriage and a drive unit to position the sensor at the required position.

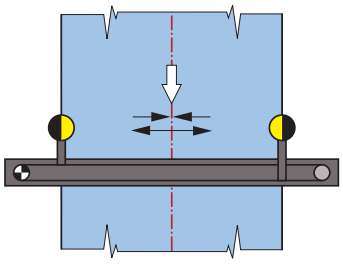
Motorized sensor positioning Support beam VS 8025

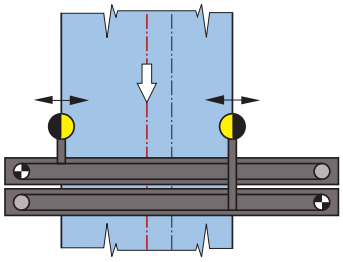
This version comprises two carriages that are coupled together via a toothed belt moved in or out together by a drive unit.

Motorized sensor positioning Support beam VS 8035

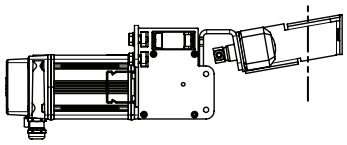
This support beam possesses two carriages, each with its own independent drive unit. This means that the left and right sensors may be adjusted independently of one another. By synchronously controlling the drives, it is possible to offset the web over the full width of the area.



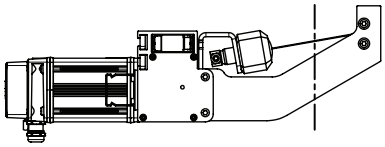




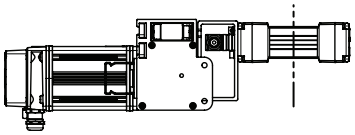
Attachment of sensor variants



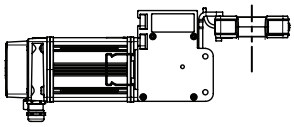
FR 52 infrared edge sensor with reflector bar



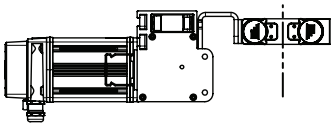
FR 52 infrared edge sensor with reflector



FX 42/FX 52 ultrasonic edge sensor



FX 46 ultrasonic edge sensor
FR 46 infrared edge sensor



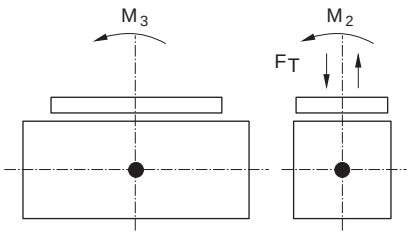
FR 62 infrared wide band sensor

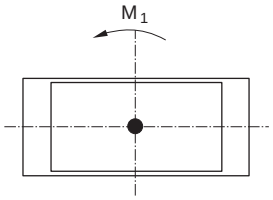
VS 80 support beam

Technical data

VS 80 support beam		
Operating voltage, nominal value Operating voltage, nominal range	24 V DC 20 to 30 V DC (ripple included)	
Current consumption	1.4 A DC (1 positioning drive) 2.4 A DC (2 positioning drives)	
Electrical connections	Operating voltage 24 V DC Operating voltage AG 9 Communication AG 9 Sensor CAN Sensor PoE Ethernet networking Digital inputs (configurable) Digital outputs (configurable)	Spring terminal M12 connector, L-coded M8 connector, D-coded 2 x M8 connectors 2 x M8 connectors 3 x M8 connectors 10 x spring terminals 2 x spring terminals
Interface	Ethernet EL.NET protocol	
Fieldbus interface, optional	Ethernet UDP Ethernet/IP Profinet	EtherNet/IP ODVA
Operating width	Min. 160 mm	Max. 5840 mm
Nominal actuating speed	1 to 100 mm/s	
Nominal actuating force	20 N	
Load	Max. 50 N	
Torque M1, M2, M3	Max. 2 Nm	
Positioning accuracy	≤ ±0.1 mm (per slide)	
Ambient temperature	+10 to +50 °C	
Storage temperature	-25 to +80 °C	
Ambient conditions	Dry	
Relative humidity	15 to 95 % (non-condensing)	
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU 72210743 01	
Protection class	IP 54	
Weight VS 8015 VS 8025 VS 8035	 For NW 1000 mm 10 kg, per 100 mm step 0.6 kg For NW 1000 mm 11 kg, per 100 mm step 0.6 kg For NW 1000 mm 12 kg, per 100 mm step 0.6 kg	

Technical Data





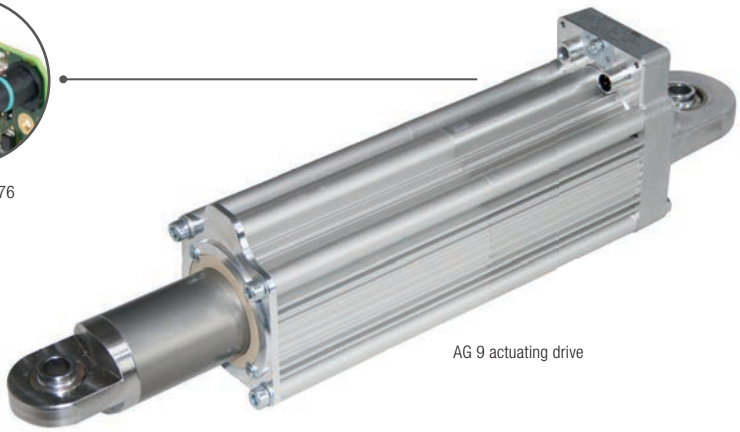
POSITION DETECTION
High resolution and absolute

Position controller RK 4030 / RK 4072 / RK 4076

Position controller and motor output stage

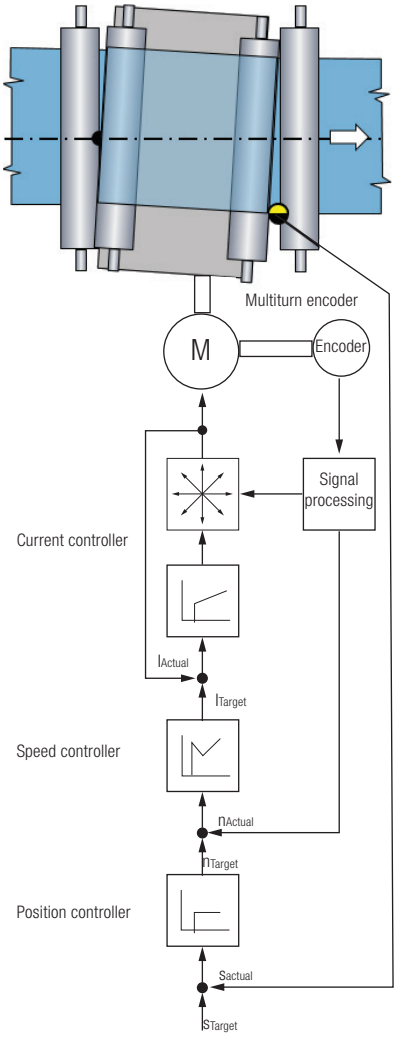
- Highly compact position controller and motor output stage integrated into the actuator and into the support beam
- Interference-free transmission of the encoder signals (angular position and absolute value encoder)
- Continuous temperature monitoring on the motor winding
- Signal transmission actuator - command station via Ethernet

Control card RK 4076



AG 9 actuating drive

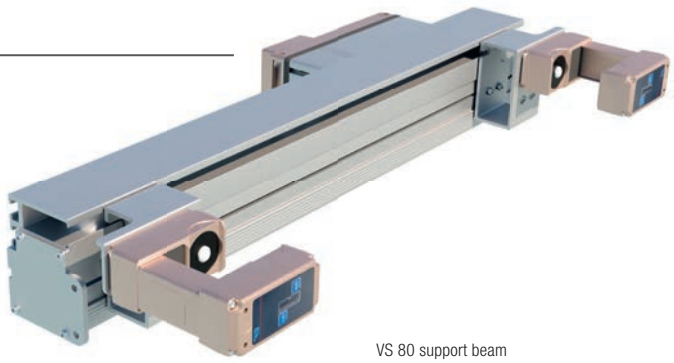
Control structure (proportional actuator)



Control card RK 4030

DRB14 pivoting frame system

Control card RK 4072



VS 80 support beam

Data network center DN 40

- Data network center for central connection of all components in a control system
- Intelligent Ethernet switch for networking several EL.NET control systems
- Integrated web-based management for easy commissioning via browser
- Simple connection to customer control systems through integrated EtherNet/IP or Profinet interface
- Robust industrial design for reliable mounting in industrial environments

DN 40 data network center

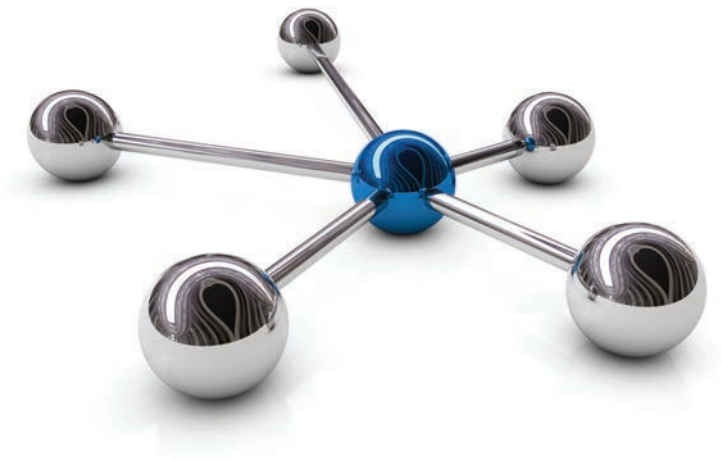
Technical Data

DN 40 data network center		
Operating voltage, nominal value Operating voltage, nominal range	24 V DC 20 to 30 V DC (ripple included)	
Current consumption	0.1 A (without actuating drive)	
Electrical connections	Operating voltage 24 V DC Operating voltage AG 9 Communication AG 9 Sensor CAN Sensor POE Ethernet networking Digital inputs (configurable) Digital outputs (configurable)	Spring terminal M12 connector, L-coded M8 connector, D-coded 2 x M8 connectors 2 x M8 connectors 3 x M8 connectors 5 x spring terminals 1 x spring terminal
Interface	Ethernet EL.NET protocol	
Fieldbus interface, optional	Ethernet UDP Ethernet/IP Profinet	
Ambient temperature	+10 to +50 °C	
Storage temperature	-25 to +80 °C	
Ambient conditions	Dry	
Relative humidity	15 to 95 % (non-condensing)	
Certifications	CE conformity NRTL certificate CU 72210743 02	
Protection class	IP 54	
Dimensions (L x W x H)	240 x 80 x 55 mm	
Weight	1.6 kg	

EL.NET
100% self-organizing

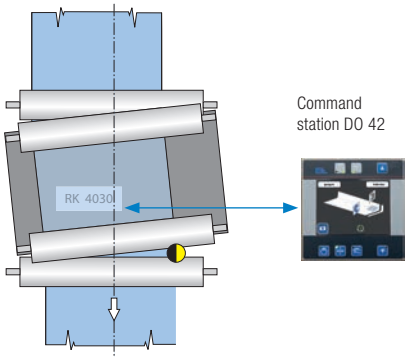
EL.NET networking

- E+L control components with Ethernet connection for Plug and Play
- Straightforward integration into a customer's existing network
- EL.NET is a multicast system, messages are sent directly to subscribers
- Automatic topology detection for series or star networks
- Manual or automatic address assignment through DHCP server
- Maximum of 255 guiding systems can be networked
- Integrated back-up solution for problem-free replacement of guiding components

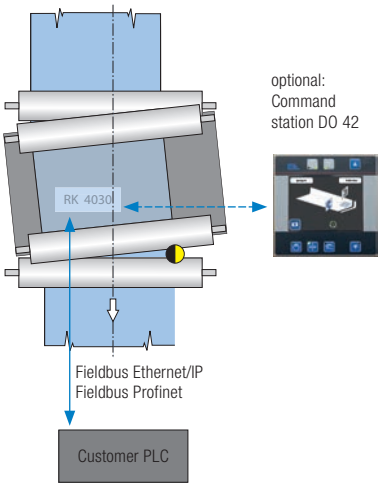


Connecting compact pivoting frames to a network

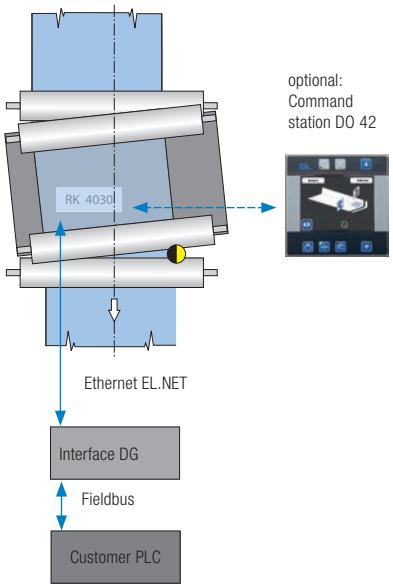
Compact pivoting frame system with external DO 42 command station



Compact pivoting frame system with standard interface Ethernet/IP/Profinet

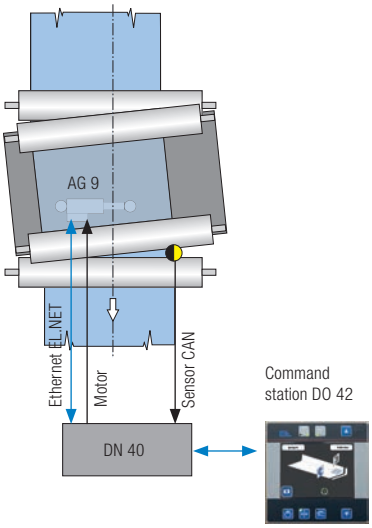


Compact pivoting frame system with DG interface module

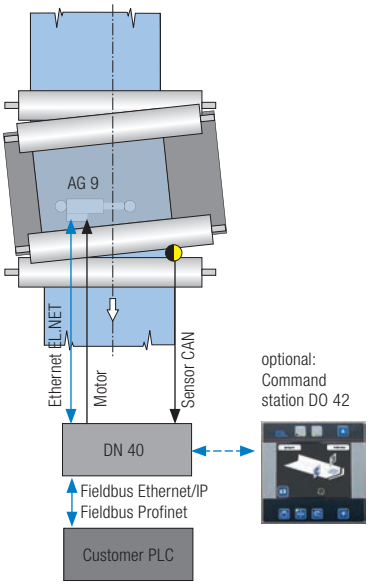


Networking of large pivoting frames, steering rollers, turning bars and winding stations with manual sensor positioning

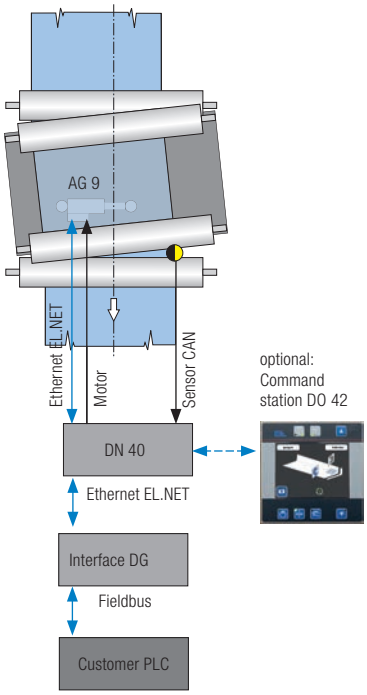
Web guiding system with command station



Web guiding system with standard interface Ethernet/IP/Profinet

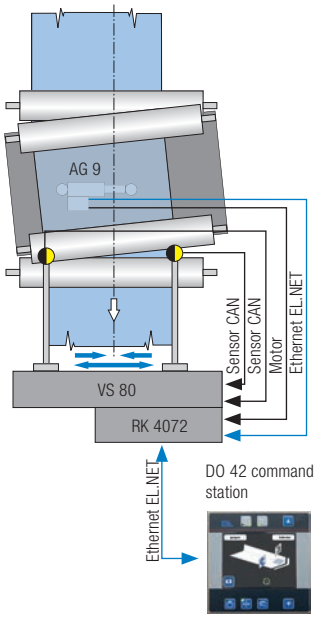


Web guiding system with interface module

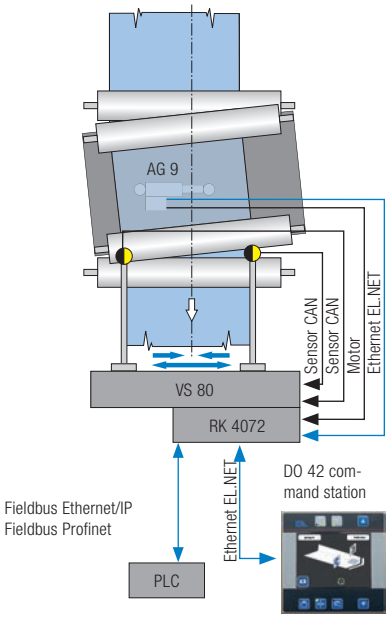


Networking of large pivoting frames, steering rollers, turning bars and winding stations with motorized sensor positioning

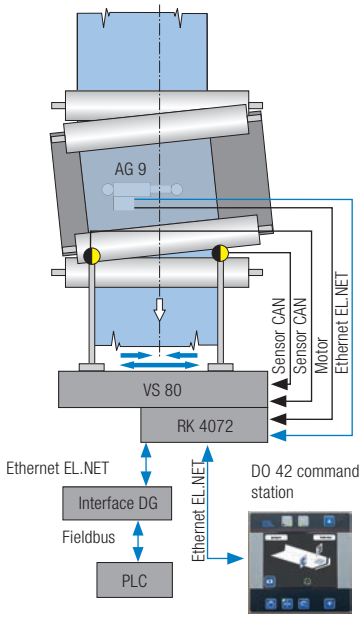
Web guiding system with sensor positioning and command station



Web guiding system with sensor positioning and standard interface

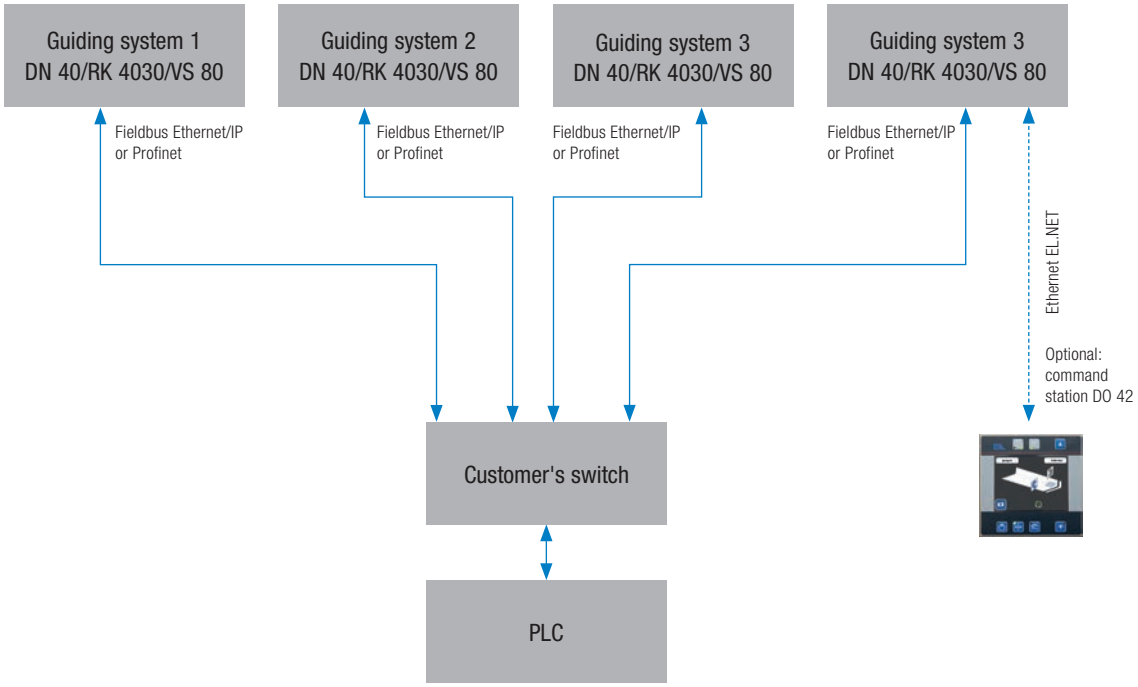


Web guiding system with sensor positioning and interface module

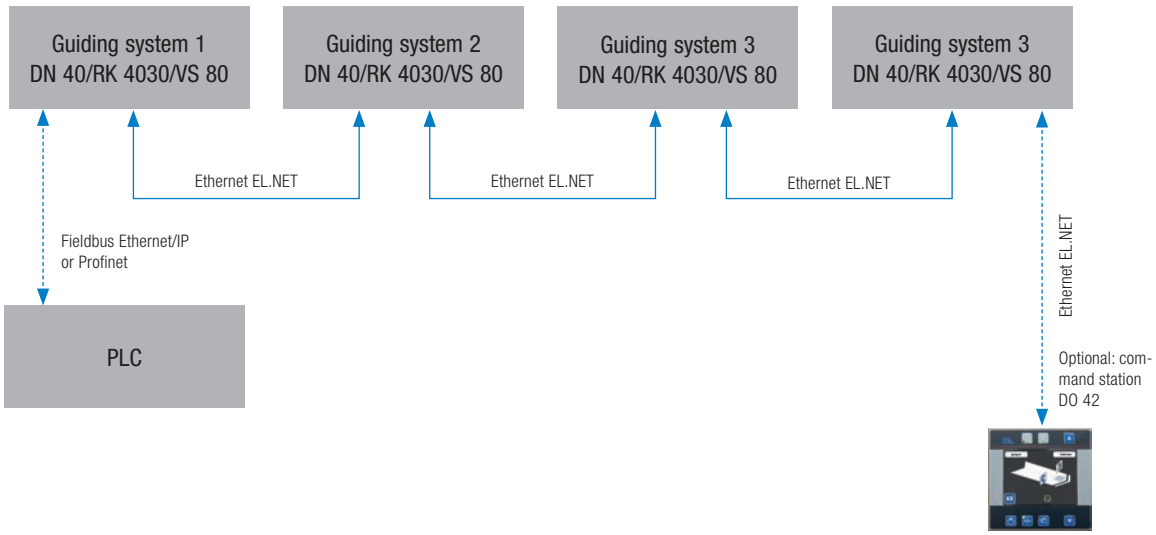


Networking of EL.NET systems

Star networking of multiple web guiding systems



Series networking of multiple web guiding systems



Interface DG*

- Fieldbus interface with communication module for the connection of EL.NET systems to customer controllers
- Communication modules for flexible implementation of different fieldbus interfaces

DG 0401 interface

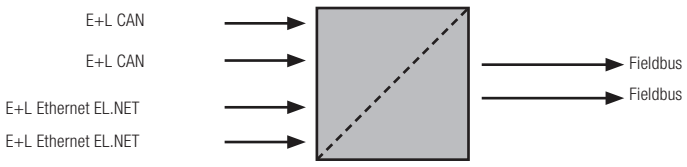
Selection table

Type	Interface
DG 0101**	Profibus
DG 0201	**Ethernet/IP**
DG 0301**	Modbus/TCP
DG 0401	**ControlNet**
DG 0501**	DeviceNet
DG 0601**	Powerlink
DG 0701	**Profinet**
DG ____**	CANopen
DG ____**	EtherCAT
DG ____**	CC Link IE Field

** On request

Technical data

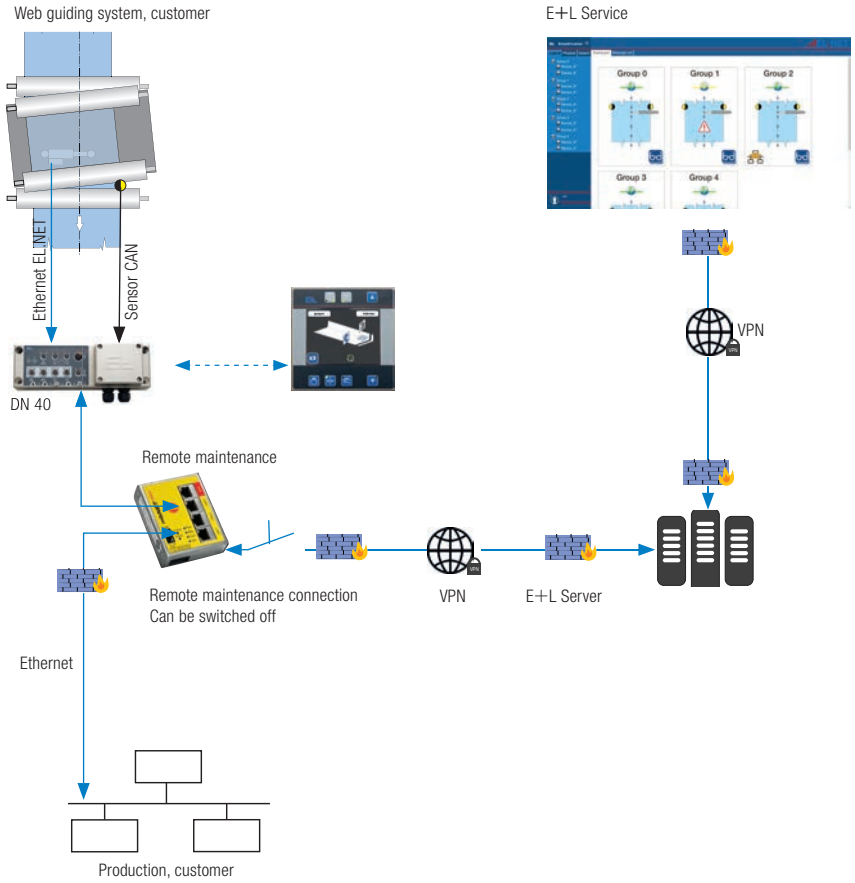
Interface DG 0	
Interface	**Fieldbus, see selection table** 2x Ethernet RJ 45 for EL.NET system 2x CAN, M16 for CAN bus system
Operating voltage Nominal value Nominal range	Terminals 24 V DC 20 to 30 V DC (ripple included)
Current consumption	Max. 0.2 A DC
Protection class	IP 20
Storage temperature	-25 to +80 °C
Ambient temperature	+10 to +60 °C
Relative humidity	15 to 95 % (non-condensing)
Assembling	DIN rail to EN 50022 (35 x 7.5 mm)
Dimensions L x W x H	125 x 76 x 133 mm
Weight	0.8 kg
Certification	CE conformity



* in preparation

Remote maintenance

- Optionally, remote maintenance access for services can be provided
- All the incoming connections are combined on E+L servers
- E+L offers three variants:
  - WAN (cabled)
  - 4G (LTE), mobile communications (SIM card required)
  - WiFi (wireless)
- Remote maintenance connection can be switched off or disconnected by the customer
- Secure connections through integrated firewalls and VPN tunnel
- Only administrated access possible on E+L side



Selection table

Type	8860	8862 ATT	8862 EU	8863
USB port	1x	1x	1x	1x
Digital input	2x	2x	2x	2x
LAN interface	3x	4x	4x	4x
WAN interface	1x			
SIM card reader (for mini SIM)		1x	1x	
SMA socket		2x	2x	
RP-SMA socket				1x
GSM modem 4G (LTE)		1x	1x	
WiFi modem				1x

Technical Data

Remote maintenance	
Operating voltage Nominal value Nominal range	 24 V DC 10 to 30 V DC
Current consumption	250 mA
Area of application	Dry
Ambient temperature	+10 to +50 °C
Storage temperature	-20 to +60 °C
Relative humidity	15 to 95 % (non-condensing)
Installation	DIN rail to EN 50022 (35 x 7.5 mm)
Protection class	IP 20
Weight	240 g
Dimensions (W x D x H)	69 x 38,5 x 99.5 mm
General approval	EN 61000-6-4:2011-9; EN 61000-6-2:2006-3; EN 60950-1:2014-08; ETSI EN 300 328 V1.8.1 (2012-06) Electromagnetic compatibility and Radio spectrum Matters (ERM)
Certifications	CE PROG. CNTLR. E482663

Devices with LAN/WAN/USB (E+L material number 504281)	
LAN interface	10/100 Mbit/s full and semi-duplex operation, automatic detection of patch cable / cross-over cable (autodetection)
WAN interface	10/100 Mbit/s full and semi-duplex operation, automatic detection of patch cable / cross-over cable (autodetection)
Digital input	2 x 10 – 30 V DC (low 0 – 3.2 V DC, high 8 – 30 V DC)

#504281

Devices with LTE (4G) modem EU (E+L material number 474866)	
Country of use	Europe, Australia
GSM/GPRS/EDGE	900, 1800 MHz; max. 236 kbps
HSxPA	850, 900, 2100 MHz; downlink max. 42 Mbps, uplink max. 5.76 Mbps
LTE	800 (B20), 1800 (B3), 2600 (B7) MHz; downlink max. 100 Mbps, uplink max. 50 Mbps
TAC	35985205
Digital input	2 x 10 – 30 V DC (low 0 – 3.2 V DC, high 8 – 30 V DC)

#474866

Devices with LTE (4G) modem NA (E+L material number 474872)	
Country of use	North America
GSM/GPRS/EDGE	850, 1900 MHz; max. 236 kbps
HSxPA	1900 (B2), 850 (B5) MHz; downlink max. 21 Mbps, uplink max. 5.76 Mbps
LTE	1900 (B2), AWS 1700 (B4), 850 (B5), 700 (B17) MHz; downlink max. 100 Mbps, uplink max. 50 Mbps
FCC	FCC ID: R17LE910NA
Digital input	2 x 10 – 30 V DC (low 0 – 3.2 V DC, high 8 – 30 V DC)

Devices with WiFi Modem (E+L material number 504282)	
WiFi	IEEE802.11b/g & 802.11n (1T1R mode), up to 150 Mbit/s
WiFi specification	EU (2.412 GHz-2.472 GHz, channel 1-13) · USA (2.412 GHz-2.462 GHz, channel 1-11) · WPA/WP2, 64/128/152 bits WEP, WPS · 802.11b: 1,2,5.5,11 Mbps · 802.11g: 6,9,12,18,24,36,48,54 Mbps · 802.11n: (20 MHz) MCS0-7, up to 72 Mbps · 802.11n: (40 MHz) MCS0-7, up to 150 Mbps
FCC	FCC ID: YWTWFXM05
Digital input	2 x 10 – 30 V DC (low 0 – 3.2 V DC, high 8 – 30 V DC)

#504282

EL.NET
Remote Service

Service and commissioning

- EL.NET components with integrated web server
- Customer-friendly commissioning with prompts and service via standard web browser

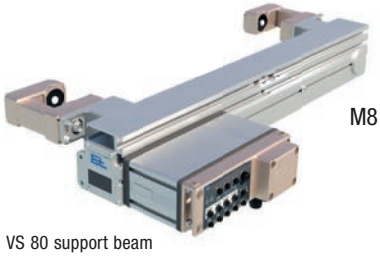
#STARTSMART

- INTEGRATION
- OPERATION
- SERVICE

Components with web server

Compact pivoting frame DRB14/23/25

DN 40 data network center



VS 80 support beam

M8

Ethernet EL.NET

M8

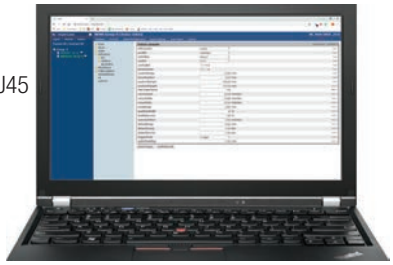
Ethernet EL.NET

M8

Ethernet EL.NET

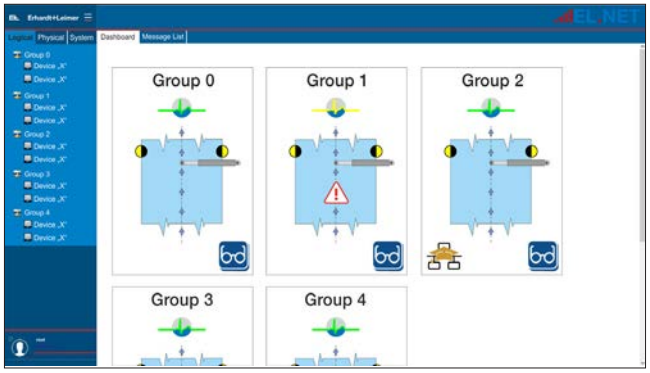
Service tool via web browser

RJ45



Web-based management

- EL.NET components with integrated web server
- Customer-friendly, guided commissioning with prompts and service via standard web browser
- Using a standard browser on a PC, the following information can be conveniently retrieved from the EL.NET network and configured:
  - Network overview
  - Control group overview
  - Parameter view, control components
  - Scan of the sensor signal

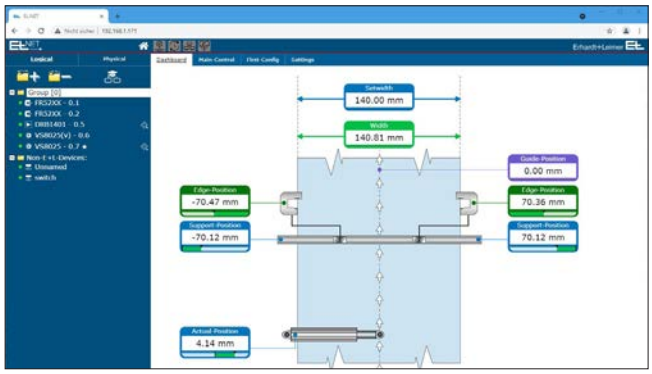


Controller group after commissioning

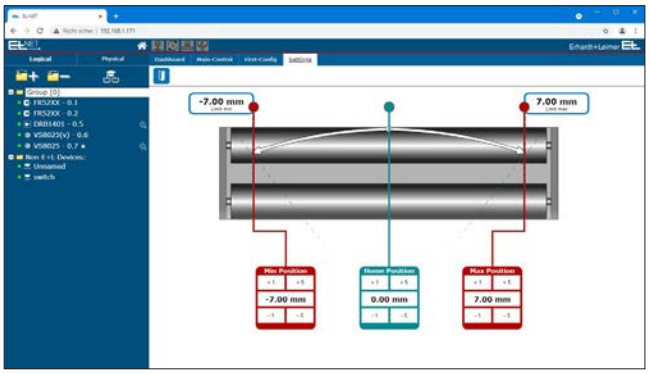
Actuator selection

Parameter view, wide band sensor

Parameter view, actuating drive



Parameter view, web guiding system



Parameter view, actuator

DO 42 command station

DO 42 command station

- Man-machine interface with intuitive user prompts
- Visualization and operation of web guiding system
- Multiple operation of up to 255 web guiding control circuits
- Selection of the country-specific language
- Integrated backup features for saving the device settings
- Color LC display 1/4 VGA with touch control unit
- Language-neutral error messages
- Integrated PoE (Power over Ethernet) connection

DO 42 command station

Fastening set 364958

Selection table

DO 42 command station		
Type	Front panel installation	Housing for field assembly
DO 4221		■
DO 4222	■	

DO 42 rear side

Technical data

Command stations DO 42	
Operating voltage	Power over Ethernet (48 V DC)
Current consumption	200 mA DC
Dimensions Front panel installation Mounting opening for front panel installation	 100 x 100 x 34 mm 92 x 92 mm
Interface	Ethernet EL.NET protocol
Display	1/4 VGA (320x240 pixels), 16 colors, LED background lighting
Operation	Touch screen with buttons
Ambient temperature	+10 to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Protection class	IP 54
Weight	0.84 kg
Language, operation	German, English, French, Italian, Hindi, Taiwanese, Japanese, Chinese, Romania, Russian, Polish, Portuguese, Spanish, Korean, Danish, Estonian, Finnish, Greek, Latvian, Lithuanian, Dutch, Swedish, Slovak, Slovenian, Czech, Hungarian, Bulgarian
Certification	CE conformity

Command station DO 32 (stand alone)

DO 32 command station

- Touch operation with data network center for all control components
- Intuitive operation of the web guiding function
  - Sensor selection
  - Determination of guiding set point
  - Web offset
  - Oscillation
  - Selection of the operating mode
  - Adjustable gain and actuating speed
- Button lock to prevent unintentional access
- Can be used with ELWINDER winding station systems

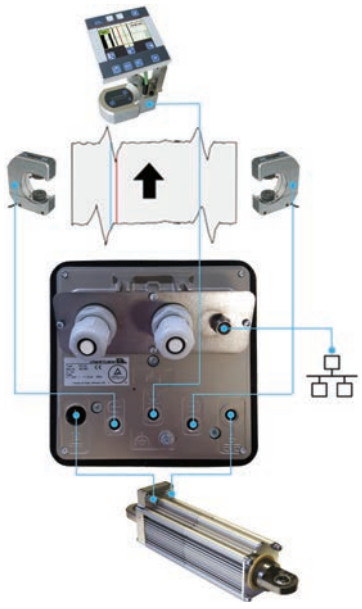
DO 32 command station

Bracket for console mounting 481401

Bracket for wall mounting 481400

Selection table

DO 32 command station		
Type	without field-bus	with fieldbus
DO 3201	■	
DO 3211		■



Connection assignment

Technical Data

DO 32 command station		
Operating voltage	Nominal value	24 V DC (terminals)
	Nominal range	20 to 30 V DC
Current consumption	AG 90 (800 N)	2.2 A
	AG 91 (1000 N)	6 A
	AG 93 (3000 N)	8 A
Dimensions	housing	135.5 x 135.5 x 66 mm
	Cut-out for panel mounting	124 x 124 mm
Sensor connections	Edge sensor	2 x M8 SensorCAN
	Line sensor	1 x M8 SensorCAN
Connections for actuating drive	Data exchange	1 x M8 D-coded Ethernet
	Operating voltage	1 x M12 L-coded
Interface to the customer's system	12 digital inputs/2 digital outputs (terminals)	
Fieldbus interface, optional	1 x M8 D-coded Ethernet	Ethernet UDP, Ethernet/IP
Display	1/4 VGA (320 x 240 pixels), 16 colors, LED background lighting	
Operation	Touch screen with buttons	
Ambient temperature	0 to +60 °C	
Relative humidity	15 to 95 % (non-condensing)	
Protection class	IP 54	
Weight	1.05 kg	
Language, operation	German, English, French, Italian, Spanish, Japanese, Dutch, Russian, Korean, Chinese, Hindi, Indonesian, Thai, Vietnamese	
Certification	CE conformity NRTL certificate CU 72170249 02	

Industry 4.0 at Erhardt+Leimer

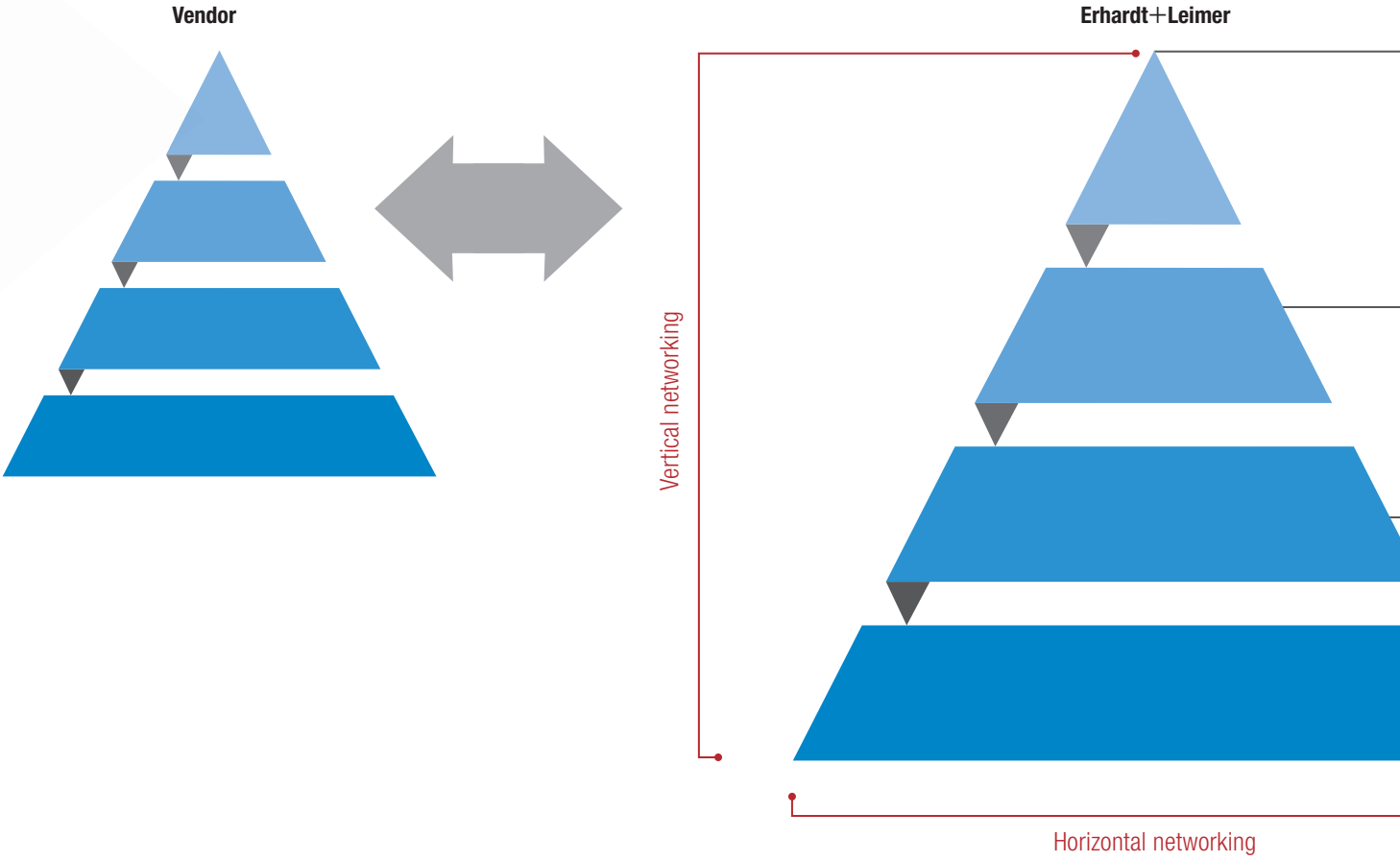
Production meets digitization

Intelligent, self-organizing processes are a key component of Industry 4.0. The digitization and networking of individual components has gained greatly in significance.
They create the basis for end-to-end automation of the entire production process - from production sequences involving multiple machines to the overriding delivery relationships between individual companies within a supply chain.

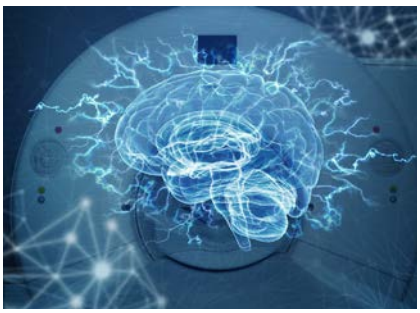
The data acquired at all levels of the production process makes up a decisive part of the automation. The generation, selection and evaluation of digital data create a high level of transparency in complex processes. It helps to optimize processes in real time and creates new machine-related and autonomous value creation processes.

Self-healing system

- Automatic configuration restoration
- Direct restore from the network
- Secure and controlled communication within a web guiding system
- No analog transmission paths



Neural network



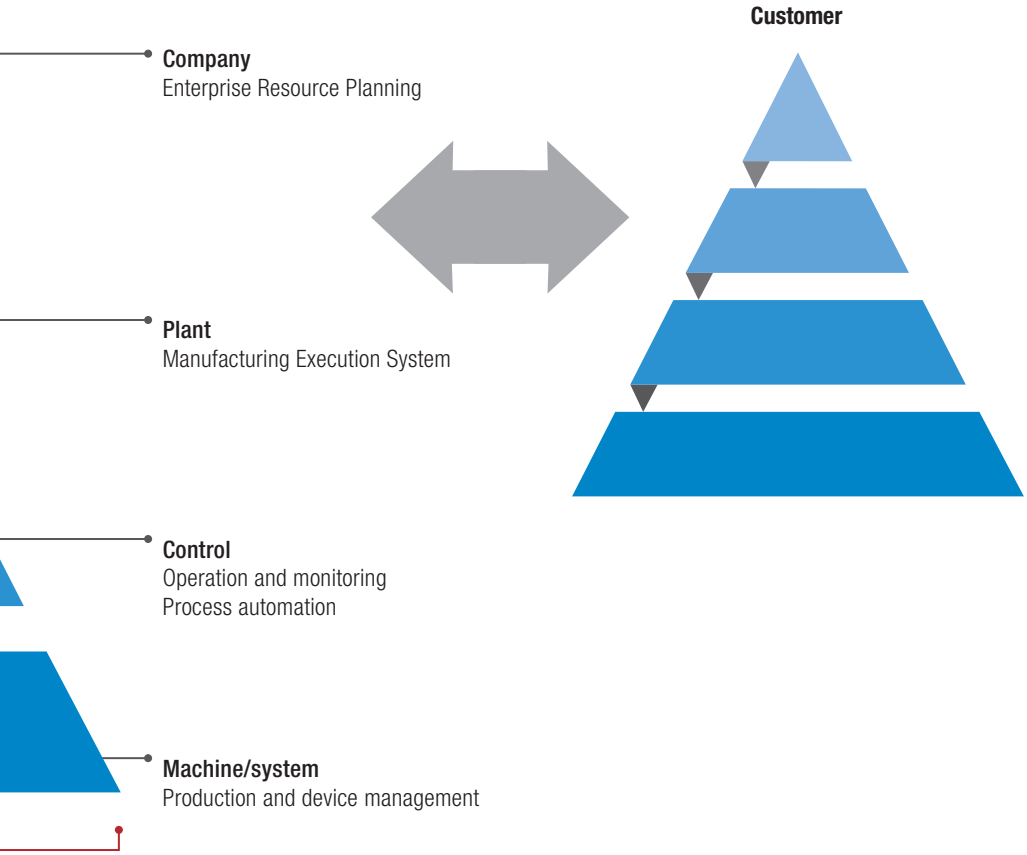
- Self-organizing system
- Intelligent control components
- Continuous digital communication

Interface ability

- Large number of fieldbus interfaces (optional)
- Integrated fieldbus interfaces
- Remote maintenance (optional)

Intuitive system handling

- Web-based management of each control component
- Individual retrieval of the system overview
- Simple, intuitive commissioning



EL.NET
Digital from the sensor to the interface

ELGUIDER pivoting frame system

Function

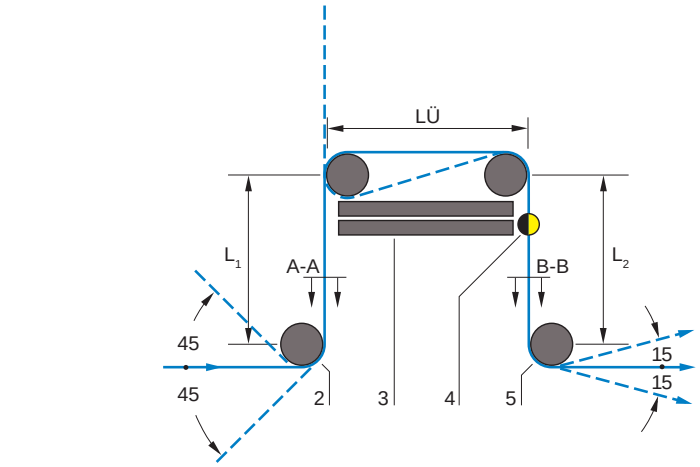
On an ELGUIDER pivoting frame system, the web changes direction four times, each time by 90°. The system is based on a pivoting frame with two path rollers. The imaginary pivot point is located on the infeed plane. Lateral web corrections can only be achieved by pivoting around this pivot point. The prerequisite here is always sufficient tension for traction between the web and the guide roller.

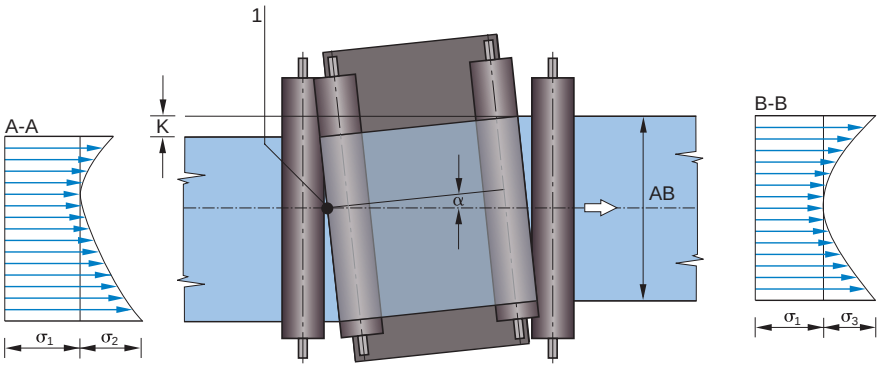
Area of use

Thanks to optimized exploitation of the elasticity ranges, the pivoting frame is particularly suited to use even in really tight spaces.

Application

The greater the web tension, the module of elasticity and the required correction, the longer the infeed, exit and transfer paths should be designed. Experience has shown that these paths should be the equivalent of 60 to 100% of the web width. The sensor should be positioned behind the positioning roller, as near to it as possible.





Legend

A-A	Web tension distribution at infeed	1	Pivot point
B-B	Web tension distribution at exit	2	Infeed roller
K	Web correction	3	Roller frame
α	Correction angle max. ±5°	4	Sensor
σ_1	Web basic tension	5	Locking roller
σ_2	Tension distribution due to pivoting movement of roller frame at the infeed	TL	Transfer length
		L_1	Infeed path
σ_3	Tension distribution due to pivoting movement of roller frame at the exit	L_2	Exit path
		AB	Operating width

Selection table, network compatibility

	ELGUIDER pivoting frame systems	ELROLLER steering roller systems	ELTURNER turning bar systems	ELWINDER winding station systems
Stand-alone systems	DRS07, DRS10, DRS20	-	-	-
Network-enabled systems	DRB14, DRB23, DRB25, DRB33, DRB73	SRB43, SRB53, SRB63	TGB13/23	WSB90, WSB91, WSB93, WSB96

Pivoting frame system DRS07 (stand alone)

ELGUIDER DRS07

- For use in the hygiene and packaging industry
- Compact design with remote controller for the best possible integration in the customer's machine
- Simple adaptation to different materials by using infrared edge sensors (FR 46, FR 60) or ultrasonic edge sensors (FX 46)
- Can be used with web tensions of up to 55 N
- Integrated fine mechanical sensor adjustment
- Cannot be networked

ELGUIDER DRS07 with infrared edge sensor FR 46

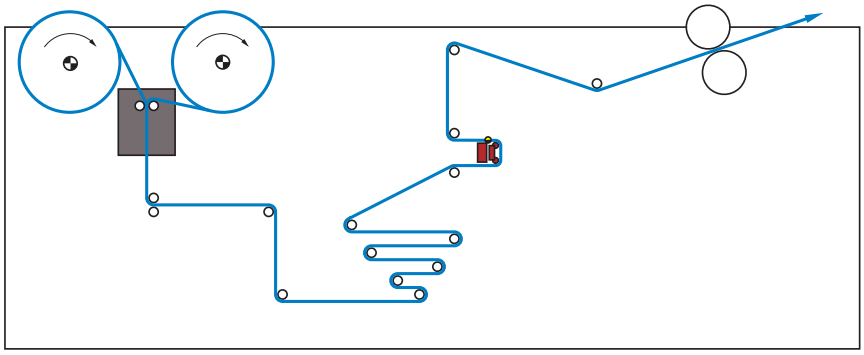
Position controller for DR 07

Selection table

Position controller DC			
Type	RK 4050	RT 4007	CAN bus
DC 0640	■		■
DC 1640	■	■	■
DC 1646	■	■	

Technical data

DRS07 pivoting frame system	
Operating voltage	
Nominal value	24 V DC
Nominal range	20 to 30 V DC
Nominal range with power supply	115 to 460 V, 50/60 Hz
Current consumption	Max. 900 mA
Nominal width NB	125 mm
Transfer length TL	105 mm
Roller diameter D	30 mm
Nominal actuating travel	max. ±7.5 mm
Actuating speed	20 mm/s
Web speed	Max. 200 m/min
Web tension	Max. 55 N
Positional accuracy	< ± 0.2 mm (material-dependent)
Error frequency	Max. 2 Hz
Ambient temperature	+10 to +50 °C
Protection class	IP 54
Measuring range	
FR 46 infrared edge sensor	±2.5 mm
Infrared wide band sensor FR 60	±79 mm
FX 46 ultrasonic edge sensor	±3 mm
Certification	Declaration of incorporation according to Machinery Directive 2006/42/EG, NRTL certificate CU 72180310 01



ELGUIDER DRS07 on packaging machine

DRS10 pivoting frame system (stand alone)

- Highly compact pivoting frame with integrated operating and control technology
- Simple adaptation to different materials by using infrared edge sensors (FR 43) or ultrasonic edge sensors (FX 43)
- Can be used with web tensions of up to 200 N
- Optional fine mechanical sensor adjustment
- Various roller surfaces available
- Cannot be networked

ELGUIDER DRS10
with infrared edge sensor FR 43

Selection table

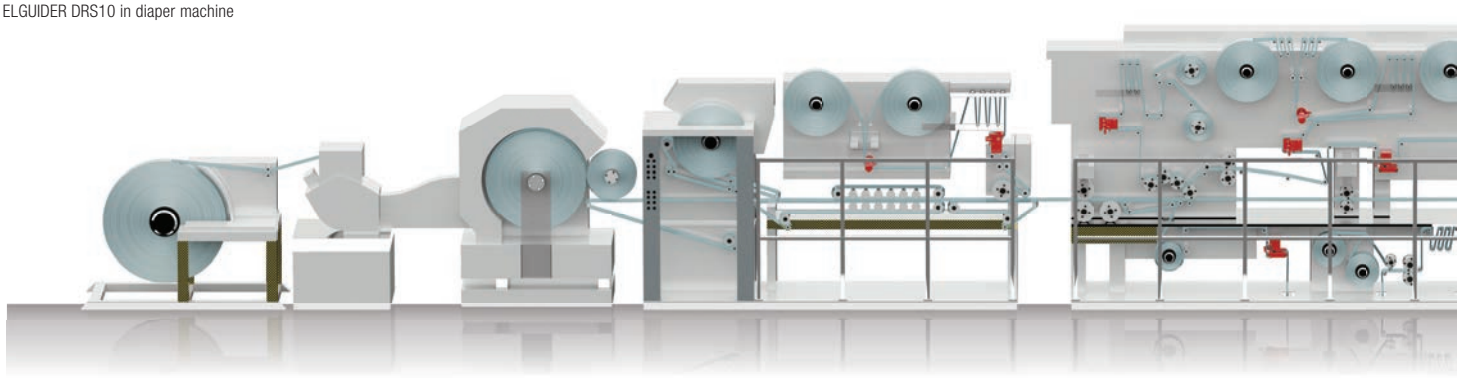
TL (mm)					
200	■	■	■	■	
180	■	■	■	■	
	160	200	250	300	NB (mm)

LÜ = Transfer length, NB = Nominal width

ELGUIDER DRS10 in diaper machine

Technical data

DRS10 pivoting frame system	
Positional accuracy	< ±0.15 mm (material-dependent)
Error frequency	2 Hz
Nominal actuating travel TL 180 mm TL 200 mm	 ±19 mm ±21 mm
Actuating speed TL 180 mm Actuating speed TL 200 mm	32 mm/s 35 mm/s
Web tension	200 N
Web speed max.	300 m/min
Roller diameter D	40 mm 60 mm
Operating voltage Nominal value Nominal range	 24 V DC 20 to 30 V DC
Current consumption	Max. 1.5 A DC
Ambient temperature	+10 to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Digital I/O interface	5 digital inputs 1 digital output
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU72180310 01
Protection class	IP 54



ELGUIDER DRS10 on baby diaper machine

Pivoting frame system DRS20 (stand alone)

- Highly compact pivoting frame with integrated operating and control technology
- Simple adaptation to different materials by using infrared edge sensors (FR 43) or ultrasonic edge sensors (FX 43)
- Can be used with web tensions of up to 200 N
- Optional fine mechanical sensor adjustment
- Various roller surfaces available
- Cannot be networked

ELGUIDER DRS20
with infrared edge sensor FR 43

Selection table

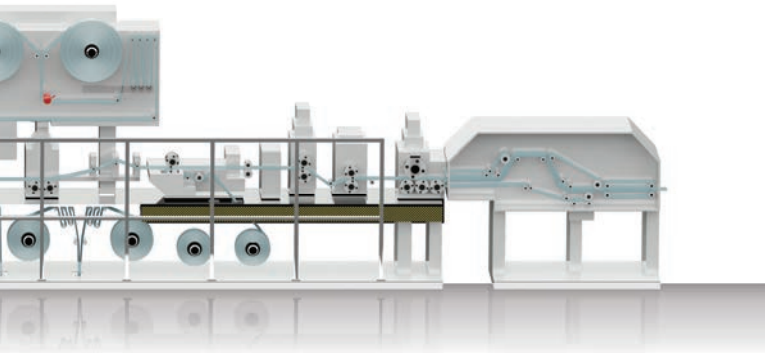
TL (mm)							
300	■	■	■	■	■	■	
250	■	■	■	■			
	200	250	300	350	400	450	NW (mm)

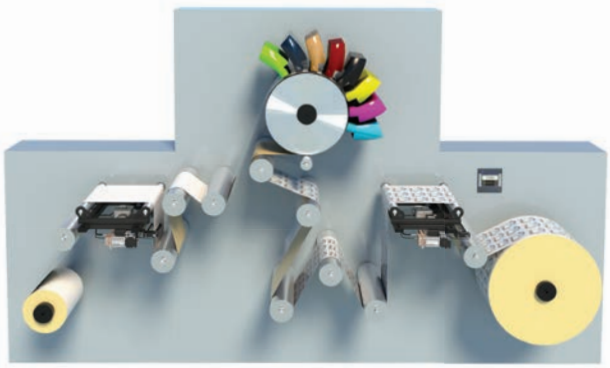
LÜ = Transfer length, NB = Nominal width

Technical data

DRS20 pivoting frame system	
Positional accuracy	< ±0.15 mm (material-dependent)
Error frequency	2 Hz
Nominal actuating travel TL 250 mm Nominal actuating travel TL 300 mm	±14 mm ±18 mm
Actuating speed TL 250 mm Actuating speed TL 300 mm	25 mm/s 29 mm/s
Web tension	200 N
Web speed max.	300 m/min
Roller diameter D	60/80 mm
Operating voltage Nominal value Nominal range	 24 V DC 20 to 30 V DC
Current consumption	Max. 1.5 A DC
Ambient temperature	+10 to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Digital I/O interface	5 digital inputs 1 digital output
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU72180310 01
Protection class	IP 54

ELGUIDER DRS20 in digital printing machine





ELGUIDER DRS20 on digital printing machine

DRB14 pivoting frame system

- Highly-compact pivoting frame system with wear-free, brushless drive technology for the highest control accuracy and control dynamics
- Can be combined with various sensors
  - FR 46 infrared edge sensor for tissue and non-woven fabric
  - FR 61 infrared wide band sensor for paper and non-woven fabric with frequent format change
  - FX 46 ultrasonic edge sensor for paper and transparent plastic materials
  - FE 52 color line sensor for printed webs with line or color contrasts
- Can be connected to EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser
- Intuitive operation due to graphical touch operating panel
- Optionally with additional command station DO 42
- Optionally with clamping and cutting table

ELGUIDER DRB14 with ultrasonic edge sensor FX 46

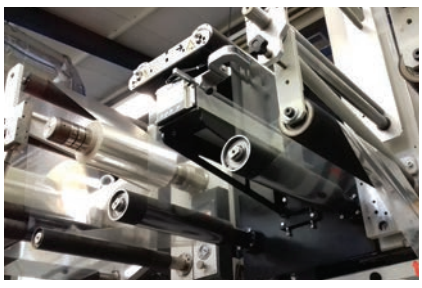
Technical data

DRB14 pivoting frame system	
Positional accuracy FR 46/FX 46/FE 52 Positional accuracy FR 61	<±0.1 mm (material-dependent) < ± 0.2 mm (material-dependent)
Error frequency	Max. 8 Hz
Nominal actuating travel TL 180 mm/200 mm Nominal actuating travel TL 250 mm/300 mm	Max. ±19 mm/max. ±21 mm Max. ±14.5 mm/max. ±18 mm
Nominal actuating speed at outfeed roller	Max. 150 mm/s
Web tension	Max. 300 N
Roller diameter D	40/60/80 mm
Ambient temperature	+10 °C to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage, nominal value Nominal range Nominal range with power supply	24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 4.5 A DC
Interface	Ethernet EL.NET protocol
Fieldbus interface, optional	Ethernet UDP Ethernet/IP Profinet
Digital I/O interface	5 digital inputs, configurable 1 output, configurable
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU 72180310 01
Protection class	IP 54

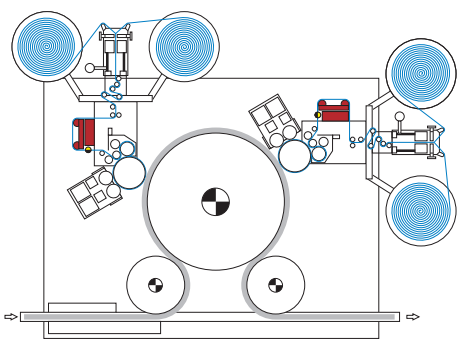
Selection table

TL (mm)								
300		■	■	■	■	■	■	
250		■	■	■	■			
200	■	■	■	■	■			
180	■	■	■	■				
	160	200	250	300	350	400	450	NW (mm)

LÜ = Transfer length, NB = Nominal width



ELGUIDER DRB14 on packaging machine



ELGUIDER DRB14 on labeling machine

DRB23 pivoting frame system

- Highly-compact pivoting frame system with wear-free, brushless drive technology for the highest control accuracy and control dynamics
- Can be combined with various sensors
  - FR 46 infrared edge sensor for tissue and non-woven fabric
  - FR 61 infrared wide band sensor for paper and non-woven fabric with frequent format change
  - FX 46 ultrasonic edge sensor for paper and transparent plastic materials
  - FE 52 color line sensor for printed webs with line or color contrasts
- Can be connected to EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser
- Intuitive operation due to graphical touch operating panel
- Optionally with additional command station DO 42
- Optionally with clamping and cutting table

ELGUIDER DRB23 with ultrasonic edge sensor FX 46

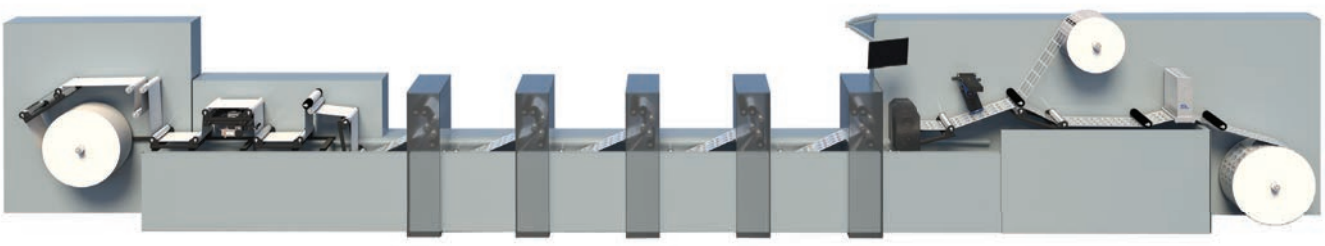
Technical data

DRB23 pivoting frame system	
Positional accuracy FR 46, FX 46, FE 52 Positional accuracy FR 61	<±0.1 mm (material-dependent) < ± 0.2 mm (material-dependent)
Error frequency	Max. 8 Hz
Nominal actuating travel	Max. ±15 mm
Nominal actuating speed at outfeed roller	Max. 100 mm/s
Web tension	Max. 700 N
Roller diameter D	60/80 mm
Ambient temperature	+10 °C to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage, nominal value Nominal range Nominal range with power supply	24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 4.5 A DC
Interface	Ethernet EL.NET protocol
Fieldbus interface, optional	Ethernet UDP Ethernet/IP Profinet
Digital I/O interface	5 digital inputs, configurable 1 output, configurable
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU 72180310 01
Protection class	IP 54

Selection table

TL (mm)	NW (mm)								
	300	350	400	450	500	550	600	700	
500	■	■	■	■	■	■	■	■	
400	■	■	■	■	■	■	■	■	
300	■	■	■	■	■	■	■		

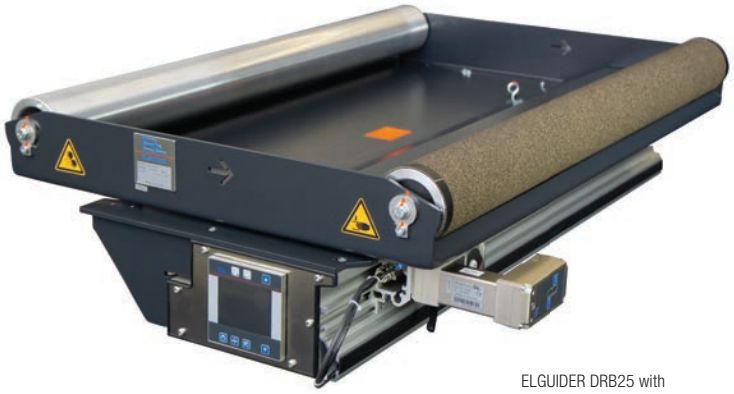
LÜ = Transfer length, NB = Nominal width



ELGUIDER DRB23 on label printing machine

DRB25 pivoting frame system

- Highly-compact pivoting frame system with wear-free, brushless drive technology for the highest control accuracy and control dynamics
- Can be combined with various sensors
  - FR 52 infrared edge sensor for tissue and non-woven fabric
  - FR 61 infrared wide band sensor for paper and non-woven fabric with frequent format change
  - FX 42/52 ultrasonic edge sensor for paper and transparent plastic materials
  - FE 52 color line sensor for printed webs with line or color contrasts
- Can be connected to EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser
- Intuitive operation due to graphical touch operating panel
- Optionally with additional command station DO 42
- Optionally with clamping and cutting table



ELGUIDER DRB25 with ultrasonic edge sensor FX 42

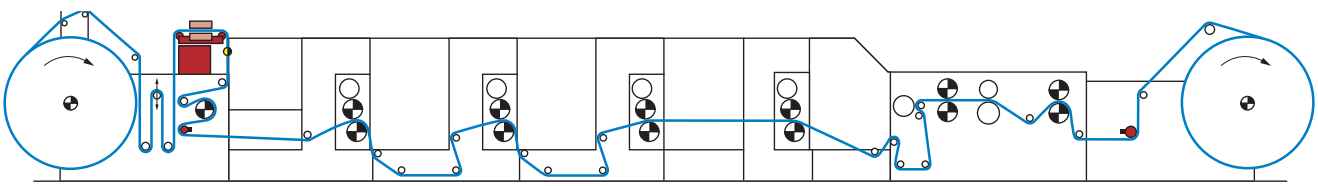
Technical data

DRB25 pivoting frame system	
Positional accuracy FR 52, FX 42, FX 52, FE 52 FR 61	<±0.1 mm (material-dependent) < ± 0.2 mm (material-dependent)
Error frequency	Max. 8 Hz
Nominal actuating travel	Max. ±25 mm
Nominal actuating speed at outfeed roller	Max. 80 mm/s
Web tension	Max. 700 N
Roller diameter	80/100 mm
Ambient temperature	+10 °C to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage, nominal value Nominal range Nominal range with power supply	24 V DC 20 to 30 V DC (ripple included) 100 bis 240 V, 50/60 Hz
Current consumption	Max. 5.5 A DC
Interface	Ethernet EL.NET protocol
Fieldbus interface, optional	Ethernet UDP Ethernet/IP Profinet
Digital I/O interface	5 digital inputs, configurable 1 output, configurable
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU 72180310 01
Protection class	IP 54

Selection table

TL (mm)	400	500	600	700	800	900	1000	1100	NB (mm)
600	■	■	■	■	■	■	■	■	
500	■	■	■	■	■	■	■	■	
400	■	■	■	■	■	■	■	■	

LÜ = Transfer length, NB = Nominal width



ELGUIDER DRS25 in form printing machine

Clamping and cutting table KT 10/20

Clamping and cutting table KT 10

- Clamping and cutting table with fixed cutting slot diagonally to direction of web travel
- Suitable for cutting unprinted webs on label printing machines
- Optionally with adhesive tape holder, pressure monitoring and pressure reducer

KT 10 fixed cutting table with angled slot

Clamping and cutting table KT 20

- Clamping and cutting table with adjustable cutting slot at 90° to direction of web travel
- Suitable for cutting webs with applied labels on rewinding and inspection machines
- Optionally with adhesive tape holder, pressure monitoring and pressure reducer

KT 20 variable cutting table with straight slot

Selection table for KT 10 and KT 20

TL (mm)	250	300	350	400	450	500	550	600	700	NB (mm)
500		■	■	■■	■	■■	■	■■	■	
400		■	■	■■	■	■■	■	■■	■	
300		■■	■■	■■	■■	■	■	■		
250	■	■	■							

■DRB14 ■DRB23 ■DRB25

Technical data

Clamping and cutting table KT 10/20	
Operating voltage compressed air monitoring (optional)	24 V DC
Current signal	Max. 100 mA
Switching threshold	>1 bar
Operating pressure	6 bar
Clamping stroke	Max. 3 mm
Adjustment range KT 20	±6 mm
Service unit filter	5 µm
Residual oil content/service unit	<0.01 mg/m³
Hose connection	Ø4 mm (external)
Core diameter, roll of adhesive tape	Ø75 mm
Width of roll of adhesive tape	Max. 50 mm
Ambient temperature	+10 °C to +50 °C
Storage temperature	-25 °C to +80 °C
Protection class (only in conjunction with pressure monitoring)	IP 40

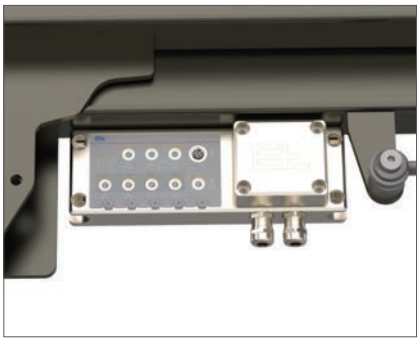
DRB33 pivoting frame system

- Pivoting frame system in frame design with wear-free, brushless drive technology for the highest control accuracy and control dynamics in the plastics and packaging industries
- Can be combined with various sensors
  - FR 52 infrared edge sensor for tissue and non-woven fabrics
  - FR 61 infrared wide band sensor for paper and non-woven fabric
  - FX 42/52 ultrasonic edge sensor for paper and transparent plastic materials
  - FE 52 color line sensor for printed webs with line or color contrasts
- Optionally with motorized sensor positioning VS 80 with frequent format change
- Can be connected to EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser

ELGUIDER DRB33 with ultrasonic edge sensor FX 42

Technical data

DRB33 pivoting frame system	
Positional accuracy FR 52, FX 42, FX 52, FE 52 FR 61	 < ± 0.1 mm (material-dependent) < ± 0.2 mm (material-dependent)
Error frequency	Max. 4 Hz
Nominal actuating travel LÜ 400 to 700 mm (DR 3311) LÜ 800 to 1100 mm (DR 3321) LÜ 1200 to 2000 mm (DR 3331) LÜ 2100 to 2500 mm (DR 3341)	 Max. ±20 mm Max. ±30 mm Max. ±55 mm Max. ±80 mm
Nominal actuating speed at outfeed roller	Max. 30 mm/s (AG 90, F=800 N)
Web tension	Max. 700 N
Roller diameter	80/100/120/160 mm
Ambient temperature	+10 °C to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage, nominal value Nominal range Nominal range with power supply	24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 2.5 A DC (AG 90, manual sensor positioning) Max. 3.7 A DC (AG 90, motorized sensor positioning) Max. 5.5 A DC (AG 91, manual sensor positioning) Max. 6.8 A DC (AG 91, motorized sensor positioning)
Interface	Ethernet EL.NET protocol
Fieldbus interface, optional	EtherNet/IP™ (ODVA-compliant), UDP/IP, PROFINET
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU
Protection class	IP 54

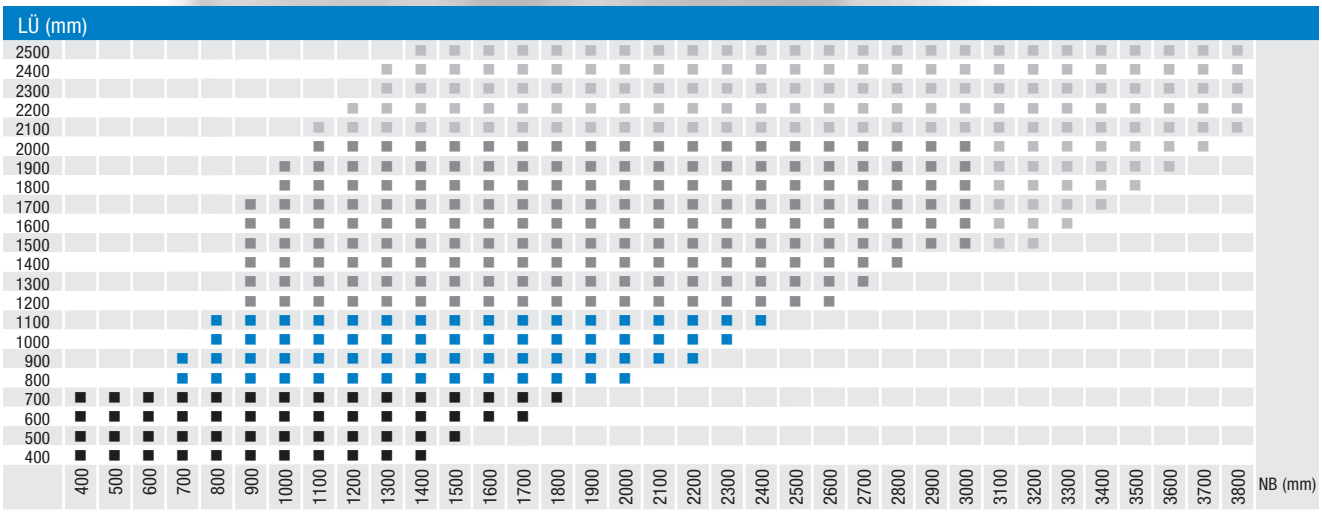


DN 40 data network center

Support beam VS 80 with data network center

ELGUIDER DRB33 in blow film extruder

Selection table



LÜ = Transfer length NB = Nominal width

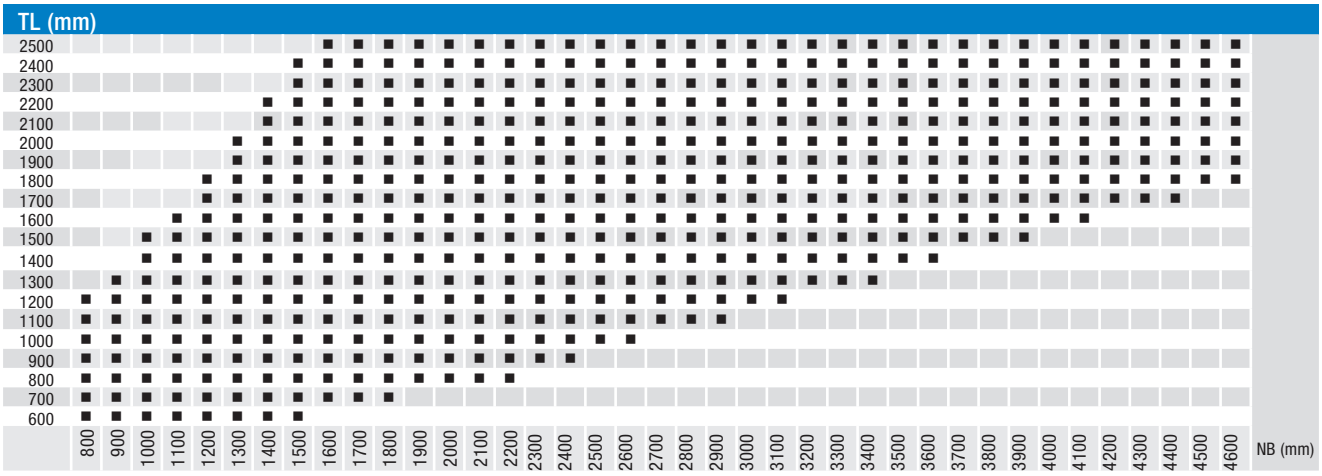
- DR 3311 (AG 90, nominal actuating travel ±20 mm)
- DR 3321 (AG 90, nominal actuating travel ±30 mm)
- DR 3331 (AG 90, nominal actuating travel ±50 mm)
- DR 3341 (AG 90, nominal actuating travel ±80 mm)

Pivoting frame system DRB73*

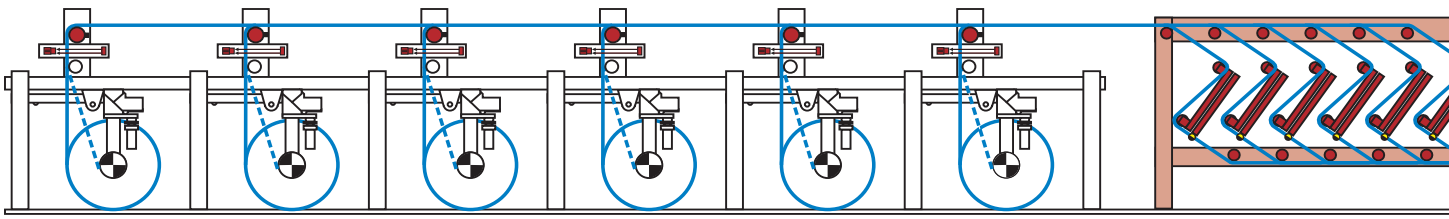
- Pivoting frame system in frame design with wear-free, brushless drive technology for the highest control accuracy and control dynamics
- Can be combined with various sensors
  - FR 52 infrared edge sensor for non-woven fabrics
  - FX 42/52 ultrasonic edge sensor for paper and transparent plastic materials
  - FE 52 color line sensor for printed webs with line or color contrasts
- Optionally with VS 80 motorized sensor positioning for rapid format changing
- Can be connected to EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser

ELGUIDER DRB73 with ultrasonic edge sensor FX 42

Selection table

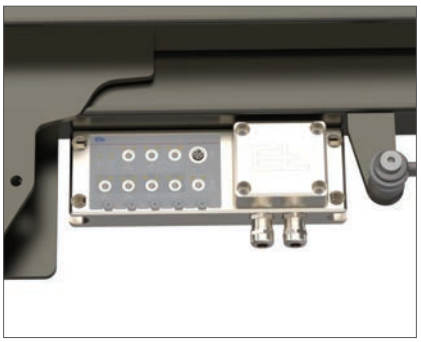


LÜ = Transfer length NB = Nominal width



ELGUIDER DRB73 in cutter sorter

* in preparation

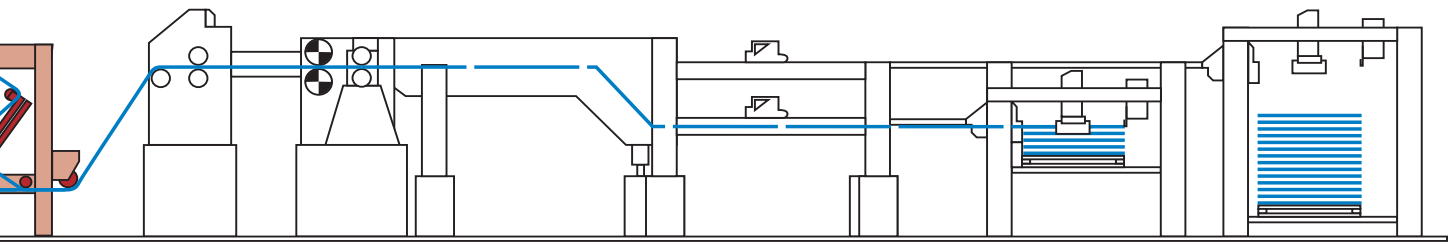


DN 40 data network center

Support beam VS 80 with data network center

Technical data

DRB73 pivoting frame system	
Positional accuracy	< ± 0.1 mm (material-dependent)
Error frequency	Max. 4 Hz
Nominal actuating travel ÜL 600 to 700 mm ÜL 800 to 1300 mm ÜL 800 to 2500 mm	 Max. ±25 mm Max. ± 50 mm Max. ±80 mm
Nominal actuating speed at outfeed roller	Max. 30 mm/s (AG 93, F=3000 N)
Web tension	Max. 2000 N (strengthened version up to 3000 N)
Roller diameter	100/120/160/200 mm
Ambient temperature	+10 °C to +50 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage Nominal value Nominal range Nominal range with power supply	 24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 8.2 A DC (manual sensor positioning) Max. 9.5 A DC (motorized sensor positioning)
Interface	Ethernet EL.NET protocol
Fieldbus interface, optional	EtherNet/IP™ (ODVA-compliant), UDP/IP, PROFINET
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU
Protection class	IP 54



ELROLLER steering roller system

Function

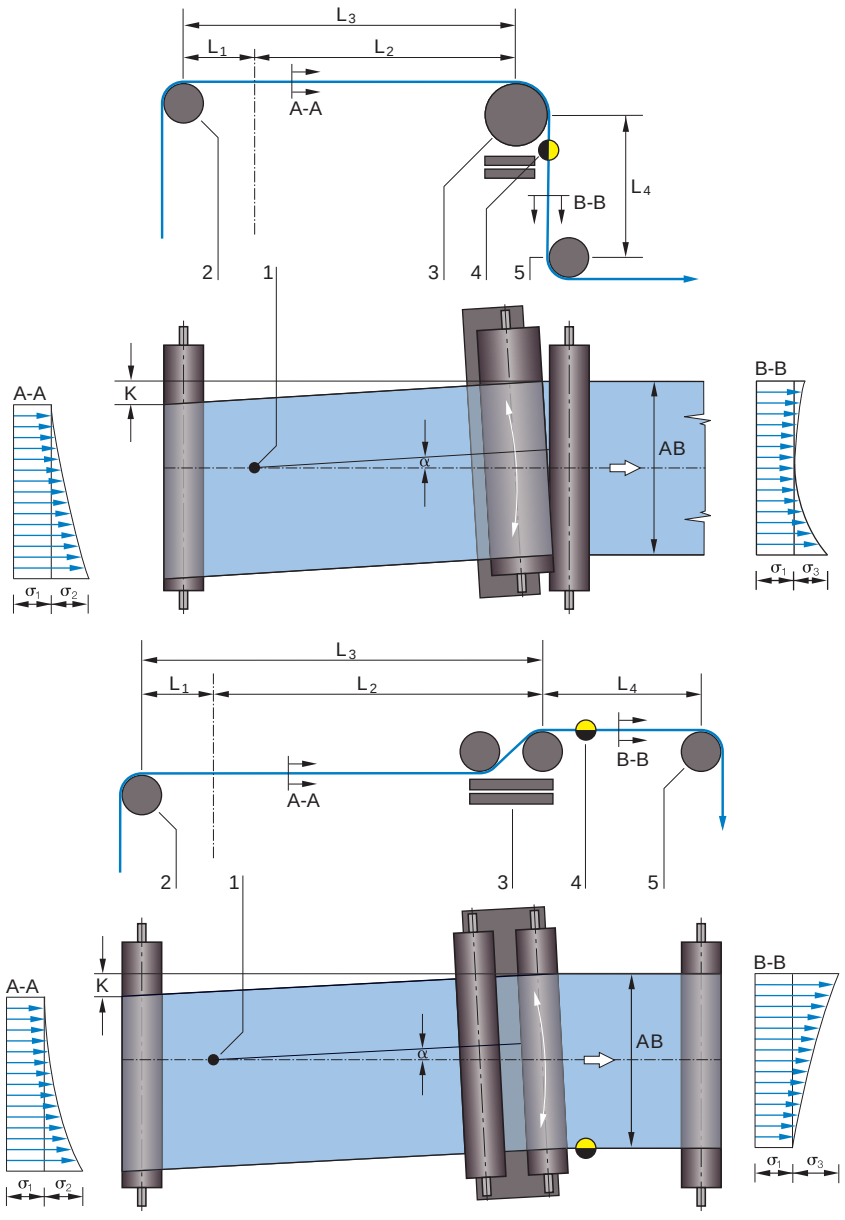
ELROLLER steering roller systems already correct the web position on the infeed plane. They consist of a fixed base frame and a movable guide frame. The latter accommodates one or two positioning rollers and swivels round an imaginary pivot point on the infeed plane. The pivot point should, on the one hand, be far enough away from the infeed roller to ensure that the web correction does not influence the infeed roller. On the other hand, it must be far enough away from the guide roller to ensure that the elasticity of the web may be fully exploited but not over-strained. A steering roller is termed a proportional actuator. It must therefore operate in a friction-locked manner and must not permit any sliding between the web and the guide roller.

Area of use

ELROLLER systems are always used where there is a long entry path due to technical process reasons.

Application

Depending on the space available, steering rollers may be fitted with one or two guide rollers. On versions with one roller, the web is guided with a wrap angle of 90°. On versions with two guide rollers less wrapping is possible. In this case, the web runs at almost the same level as the outfeed roller. The following applies when mounting an ELROLLER: the infeed path should be the equivalent of two to three times the web width, the exit path should be between 50 and 100% of the web width. The sensor should be positioned behind the positioning roller, as near to it as possible. As a result, improved control dynamics are achieved thanks to the resulting short response time.



Legend

A-A	Web tension distribution at infeed	1	Pivot point
B-B	Web tension distribution at exit	2	Infeed roller
K	Web correction	3	Positioning roller(s)
α	Correction angle	4	Sensor
σ_1	Web basic tension	5	Locking roller
σ_2	Tension distribution due to pivoting movement of roller frame at the infeed	L_1	Infeed path to the pivot point
		L_2	Infeed path to the steering roller
σ_3	Tension distribution due to pivoting movement of roller frame at the exit	L_3	Infeed path
		L_4	Exit path

SRB42 steering roller system

- Compact steering roller system with one or two rollers for different wrap angles and wear-free, brushless drive technology for highest control accuracy and control dynamics.
- Can be combined with FR 52 infrared or FX 42/52 ultrasonic edge sensor for reliable detection of paper and transparent film edges
- Optionally with VS 80 motorized sensor positioning for rapid format changing
- Integrated digital controller with position, speed and current controller for highest quality of control
- Can be connected with EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser

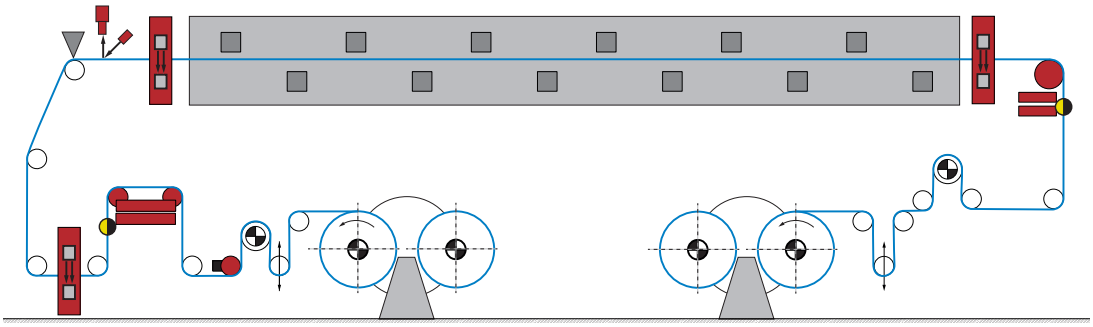
ELGUIDER SRB43 with ultrasonic edge sensor FX 52

Technical data

SRB42 steering roller system	
Positional accuracy	< ± 0.15 mm (material-dependent)
Error frequency	Max. 2 Hz
Nominal width	400 to 2400 mm
Nominal actuating travel NW 400 to 800 mm NW 900 to 1500 mm NW 1100 to 2400 mm	 ±30 mm ±55 mm ± 75 mm
Nominal actuating speed at outfeed roller	Max. 30 mm/s (AG 90 with F=800 N)
Web tension	Max. 700 N
Roller diameter SR 4311 SR 4321/SR 4331	 80/100/120/160 mm 100/120/160/200 mm
Ambient temperature	+10 °C to +50 °C
Storage temperature	-20 °C to +80 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage Nominal value Nominal range Nominal range with power supply	 24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 2.5 A DC (manual sensor positioning) Max. 3.7 A DC (motorized sensor positioning)
Fieldbus interface, optional	Ethernet UDP; Ethernet/IP; Profinet
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU
Protection class	IP 54
Weight	185 kg (nominal width 2400 mm)

Selection table

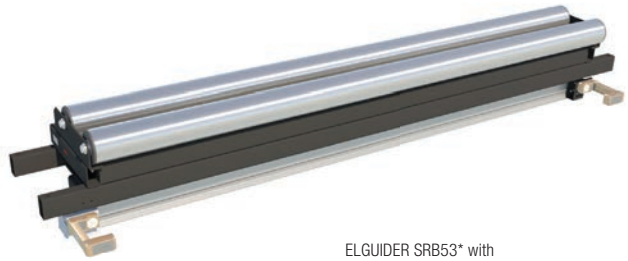
SRB43		
Type	NB min. (mm)	NW max. (mm)
SR 4311	400	800
SR 4321	900	1500
SR 4331	1100	2400



Steering roller system SRB43 in battery coating system

Steering roller system SRB53*

- Compact steering roller system with one or two rollers for different wrap angles and wear-free, brushless drive technology for highest control accuracy and control dynamics. in the converting industry
- Can be combined with FR 52 infrared or FX 42/52 ultrasonic edge sensor for reliable detection of paper and transparent film edges
- Optionally with VS 80 motorized sensor positioning for rapid format changing
- Integrated digital controller with position, speed and current controller for highest quality of control
- Can be connected with EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser



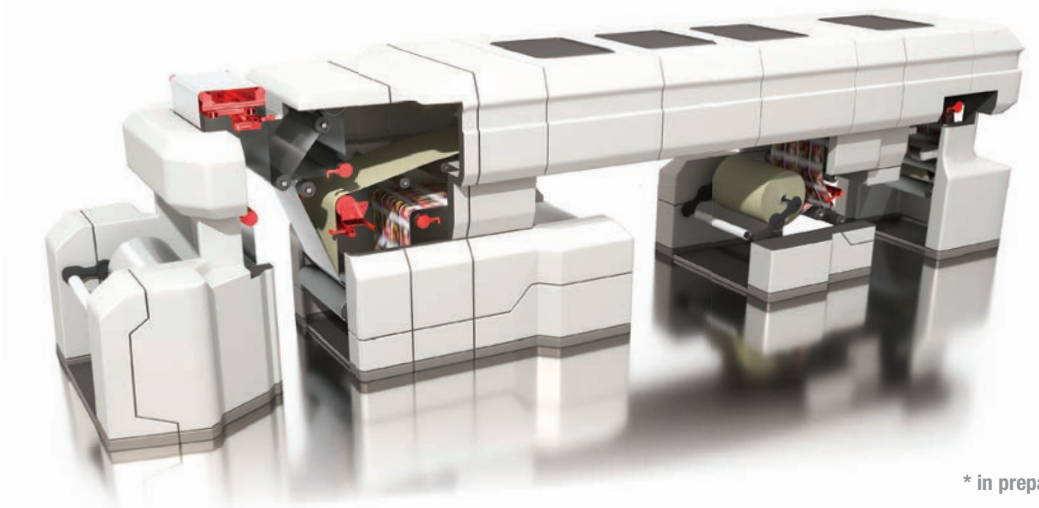
ELGUIDER SRB53* with ultrasonic edge sensor FX 52

Technical data

SRB53 steering roller system		
Positional accuracy		< ± 0.15 mm (material-dependent)
Error frequency		Max. 2 Hz
Nominal width		1100 to 4000 mm
Nominal actuating travel	NW 1100 to 2000 mm NB 1500 to 3000 mm NB 2500 to 4000 mm	± 75 mm ±100 mm ±175 mm
Nominal actuating speed at outfeed roller		Max. 30 mm/s (AG 93 with F=3000 N)
Web tension		Max. 2000 N
Roller diameter	NW 1100 to 2000 mm NB 1500 to 3000 mm NB 2500 to 4000 mm	100/120/160/200 mm 100/120/160/200 mm 160/200 mm
Ambient temperature		+10 °C to +50 °C
Storage temperature		-20°C to +80°C
Relative humidity		15 to 95 % (non-condensing)
Operating voltage	Nominal value Nominal range Nominal range with power supply	24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption		Max. 8.2 A DC (manual sensor positioning) Max. 9.5 A DC (motorized sensor positioning)
Fieldbus interface, optional		Ethernet UDP; Ethernet/IP; Profinet
Certifications		Declaration of incorporation according to Machinery Directive 2006/42/EC, NRTL certificate CU
Protection class		IP 54

Selection table

SRB53		
Type	NB min. (mm)	NW max. (mm)
SR 5311	1100	2000
SR 5321	1500	3000
SR 5331	2500	4000

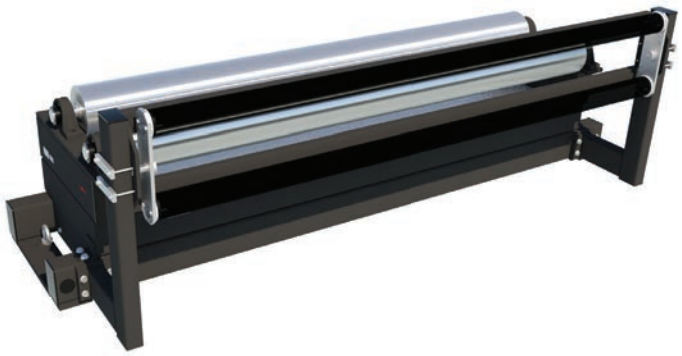


ELROLLER SRB53 on coating line

* in preparation

Steering roller system SRB63*

- Compact steering roller system with one or two rollers for different wrap angles and wear-free, brushless drive technology for highest control accuracy and control dynamics in the converting and tire industries
- Can be combined with FR 52 infrared or FX 42/52 ultrasonic edge sensor for reliable detection of paper and transparent film edges
- Optionally with VS 80 motorized sensor positioning for rapid format changing
- Integrated digital controller with position, speed and current controller for highest quality of control
- Can be connected to EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser



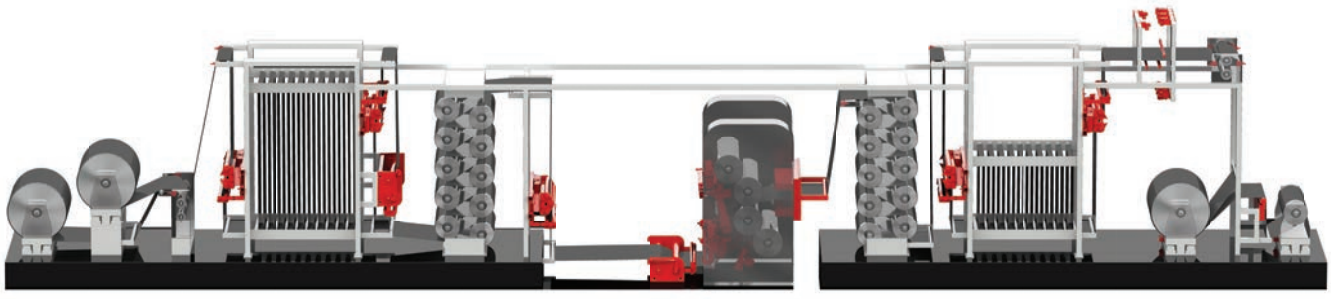
ELGUIDER SRB63* with
infrared wide band sensor FE46

Technical data

SRB63 steering roller system	
Positional accuracy	< ± 0.3 mm (material-dependent)
Error frequency	Max. 2 Hz
Nominal width	1100 to 3000 mm
Nominal actuating travel	See selection table
Nominal actuating speed at out-feed roller	Max. 30 mm/s (AG 93 with F=3000 N)
Web tension	See selection table
Roller diameter	See selection table
Ambient temperature	+10 °C to +50 °C
Storage temperature	-20 °C to +80 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage Nominal value Nominal range Nominal range with power supply	 24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 8.2 A DC (manual sensor positioning) Max. 9.5 A DC (motorized sensor positioning)
Fieldbus interface, optional	Ethernet UDP; Ethernet/IP; Profinet
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU
Protection class	IP 54

Selection table

SRB63					
Type	NB min. (mm)	NW max. (mm)	Ø roller (mm)	Actuating travel ± (mm)	Web tension max. (kN)
SR 6311	1100	3000	160/210/240	75	5
SR 6315	1200	3000	210/240	75	20



ELROLLER SRB63 on calendering line

* in preparation

ELTURNER turning bar system

Function

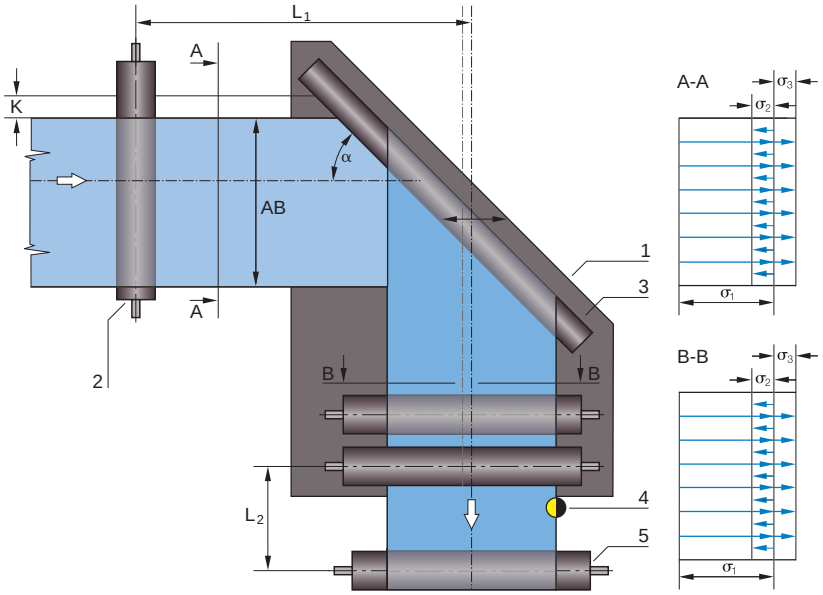
Web guiding with ELTURNER turning bar systems is based on a simple principle: a bar is mounted at an angle of 45° to the longitudinal and transverse axes while the web runs over it with 180° wrapping. This has the immediate effect of changing the direction of web travel by 90°. To correct the web position at the same time, the turning bar is moved parallel to the infeed plane according to the actuating signal, thus offsetting the web to the side as it runs off.

Area of use

Use of a turning bar control system is recommended in cases where space restrictions prevent the use of an ELGUIDER or ELROLLER system after the 90° deflection.

Application, turning bar

On the use of the turning bar there must be constant points of friction-locking between the bar and the web. To protect the web surface, the friction can be reduced by inserting an air cushion between the turning bar and the web. Guiding precision of up to ± 1 mm can be achieved. For improved adjustment dynamics, a guide roller should also be moved together with the turning bar. The distance between the guide roller and the locking roller should correspond to half the web width. The sensor should be mounted immediately after the outfeed roller as close as possible.



Legend

A-A	Web tension distribution at infeed	1	Pivoting frame
B-B	Web tension distribution at exit	2	Infeed roller
K	Web correction	3	Turning bar
α	Correction angle	4	Sensor
σ_1	Web basic tension	5	Locking roller
σ_2	Tension distribution on actuating movement to left		
σ_3	Tension distribution on actuating movement to right		

Turning bar system TGB13/23

- Compact turning bar system with wear-free, brushless drive technology for the highest control accuracy and control dynamics
- Optional turning bar with pneumatic ventilation
- Can be combined with FR 52 infrared or FX 42/52 ultrasonic edge sensor for reliable detection of paper and transparent film edges
- Integrated digital controller with position, speed and current controller for highest quality of control
- Can be connected to EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser

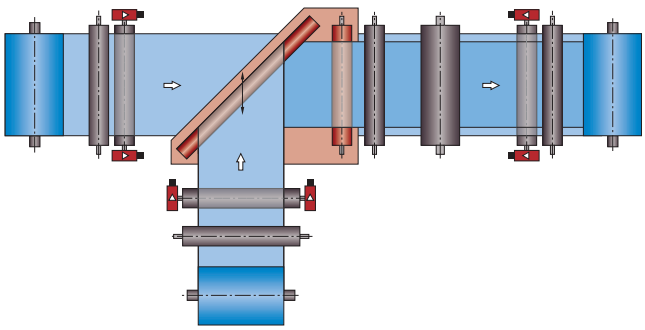
ELTURNER TGB13
with ultrasonic edge sensor FX 52

Technical data

Turning bar system TGB13/23	
Positional accuracy	< ±1 mm (material-dependent)
Error frequency	Max. 2 Hz
Nominal width	400 to 3000 mm
Nominal actuating travel	±25 mm / ±50 mm / ±75 mm / ±100 mm
Nominal actuating speed at out-feed roller	Max. 30 mm/s (AG 90 with F=800 N/AG 93 with F=3000 N)
Web tension	Max. 1000 N/2000 N
Turning bar diameter	80/100/120/160/200 mm
Ambient temperature	+10 °C to +50 °C
Storage temperature	-20 °C to +80 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage Nominal value Nominal range Nominal range with power supply	 24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 2.5 A DC (manual sensor positioning)
Fieldbus interface, optional	Ethernet UDP; Ethernet/IP; Profinet
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC
Protection class	IP 54

Selection table

TGB13/23		
Type	Nominal width (mm)	With ventilation
TG 1320	< 2000	■
TG 1321	< 2000	
TG 2320	> 2000	■
TG 2321	> 2000	



ELTURNER TGB on production machine with lateral web feeding

Pivoting frame system with turning cross ELTURNER

Function

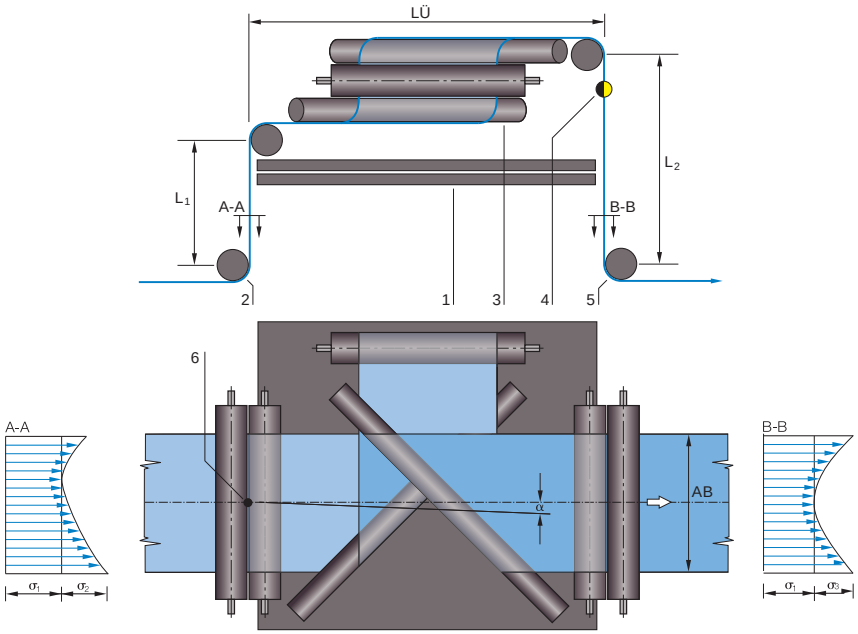
Web guiding with ELTURNER turning bar systems is based on a simple principle: a bar is mounted at an angle of 45° to the longitudinal and transverse axes while the web runs over it with 180° wrapping. Using an additional guide roller and turning bar, the web is turned such that the underside is on top. By mounting the turning bars on the pivoting frame, the lateral position of the web can be precisely controlled.

Area of use

Use of a pivoting frame system in combination with turning bars is recommended in cases where the web needs to be turned and fed to the next process with high precision.

Application

The greater the web tension, the module of elasticity and the required correction, the longer the infeed, exit and transfer paths should be designed. Experience has shown that these paths should be the equivalent of 60 to 100% of the web width. The sensor should be positioned behind the positioning roller, as near to it as possible.



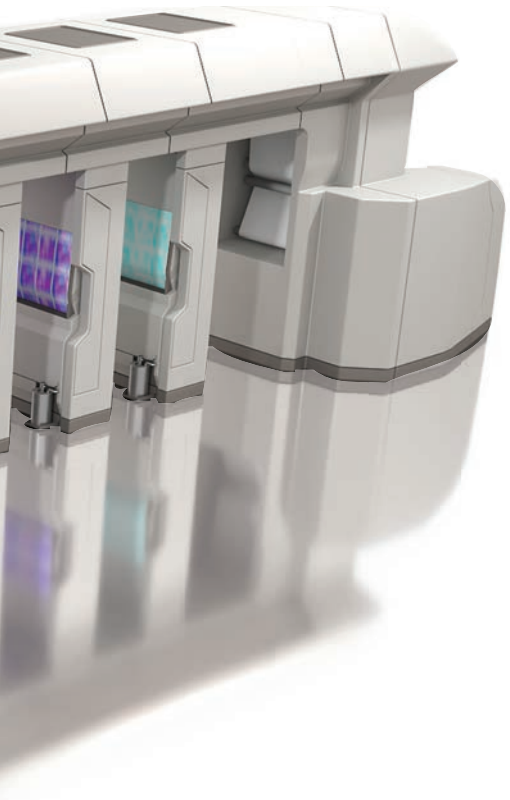
Legend

A-A	Web tension distribution at infeed	1	Pivoting frame	TL	Transfer length
B-B	Web tension distribution at exit	2	Infeed roller	L_1	Infeed path
α	Correction angle	3	Turning bar	L_2	Outfeed path
σ_1	Web basic tension	4	Sensor	AB	Operating width
σ_2	Tension distribution on actuating movement to left	5	Locking roller		
σ_3	Tension distribution on actuating movement to right	6	Pivot point		

ELTURNER VWB on gravure printing machine

Pivoting frame system with turning cross VWB33/73

- Compact pivoting frame system with turning cross and wear-free, brushless drive technology for the highest control accuracy and control dynamics
- Optional turning bar with pneumatic ventilation
- Can be combined with FR 52 infrared or FX 42/52 ultrasonic edge sensor for reliable detection of paper and transparent film edges
- Integrated digital controller with position, speed and current controller for highest quality of control
- Can be connected to EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser



Technical data

Pivoting frame system with turning cross VWB33/73	
Positional accuracy	< ± 0.1 mm (material-dependent)
Error frequency	Max. 4 Hz
Nominal width	400 to 3000 mm
Nominal actuating travel	±25 mm / ±50 mm
Nominal actuating speed at out-feed roller	Max. 30 mm/s (AG 90 with F=800 N/AG 93 with F=3000 N)
Web tension	Max. 700 N/2000 N
Turning bar diameter	80/100/120/160/200 mm
Ambient temperature	+10 °C to +50 °C
Storage temperature	-20 °C to +80 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage Nominal value Nominal range Nominal range with power supply	 24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 2.5 A DC (manual sensor positioning) Max. 3.7 A DC (motorized sensor positioning)
Fieldbus interface, optional	Ethernet UDP; Ethernet/IP; Profinet (in preparation)
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU
Protection class	IP 54

Selection table

VWB33/73		
Type	$F_{max.}$ (N)	With ventilation
VW 3330	700	■
VW 3331	700	
VW 7330	2000	■
VW 7331	2000	

ELWINDER winding station system

Function

In production processes with moving webs, there is typically an unwinder at the machine infeed and a rewinder at the exit. During unwinding, the winding station is moved via a linear drive to feed the web in the desired position. On the other hand, during rewinding, the winding station follows the constantly changing web position via a linear drive to achieve an evenly wound reel.

Area of use

Web guiders with ELWINDER winding stations are used wherever it is not possible to use ELGUIDER or ELROLLER systems due to lack of space.

Application, unwinding

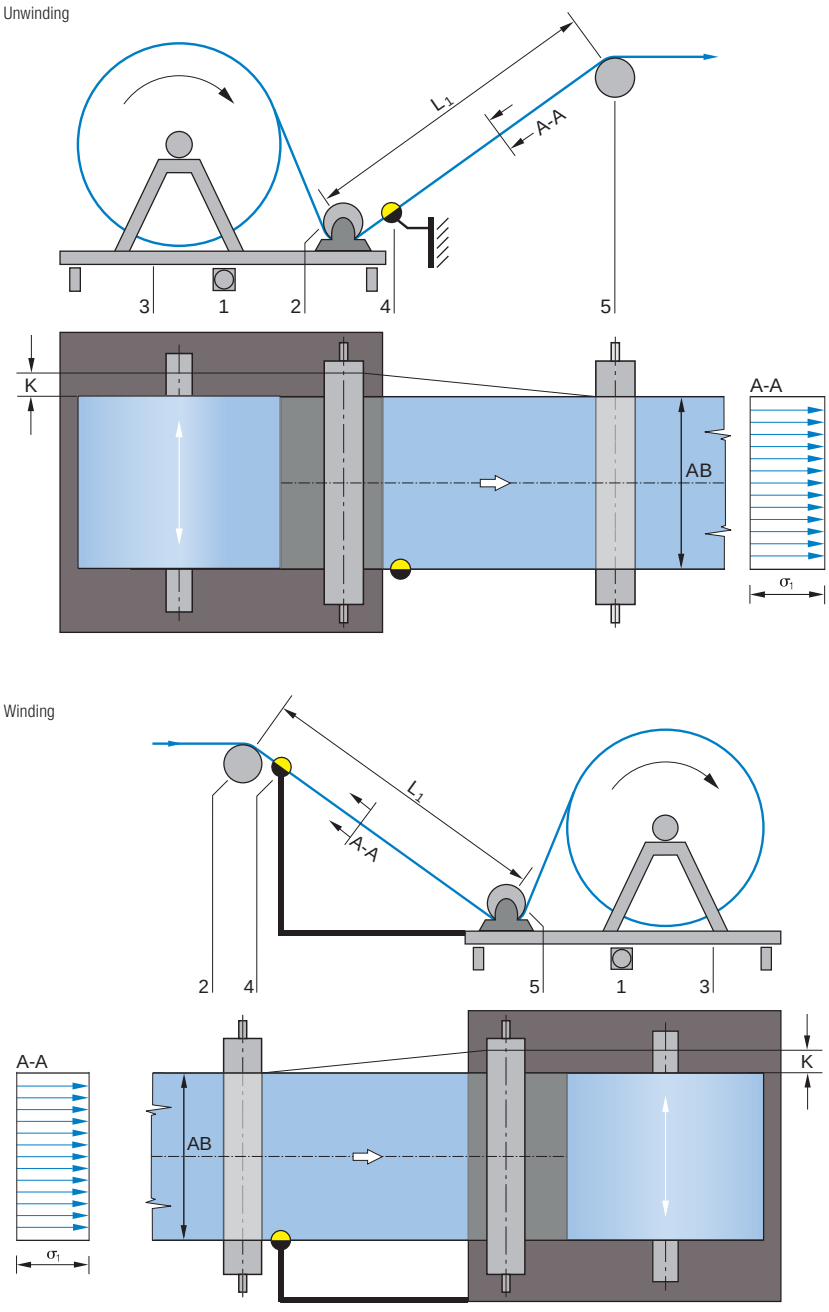
During unwinding, the sensor is mounted on the machine to define the target web position. Here, the position detection system should be located as close to the final winding station guide roller as possible.

Application, unwinding with synchronous roller

If, for space reasons, it is not possible to fit a guide roller to the winding station, it can be designed as a synchronous electrically coupled roller.

Application, rewinding

During rewinding, the sensor is fastened to the winding station to set the target position of the winding station for the controller. Here, the position detection system should be located as close to the final machine guide roller as possible. The guiding path L1 depends on the elasticity of the web. The larger the transverse elasticity range, the shorter the path L1 can be. Experience has shown that the guiding path should be the equivalent of half a web width.



Legend

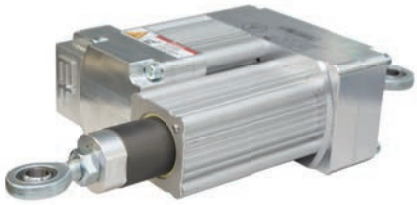
A-A Web tension distribution on the guiding path
K Web correction
σ_1 Web basic tension
AB Operating width

1 Linear drive
2 Infeed rollers
3 Winding station
4 Sensor
5 Locking roller
L_1 Guiding path

WSB90 winding station system

- Control components for winding stations with wear-free, brushless drive technology for highest control accuracy and control dynamics
- Can be combined with various sensors
  - FR 52 infrared edge sensor for non-woven fabrics
  - FX 42/52 ultrasonic edge sensor for paper and transparent plastic materials
  - FE 52 color line sensor for printed webs with line or color contrasts
- Integrated digital controller with position, speed and current controller for highest quality of control
- Optionally with integrated fieldbus interface Ethernet/IP or Ethernet UDP
- Simple service and diagnostics option using web-based management with a standard web browser

Ultrasonic edge sensor FX 42



Actuating drive AG 90

DO 32 command station

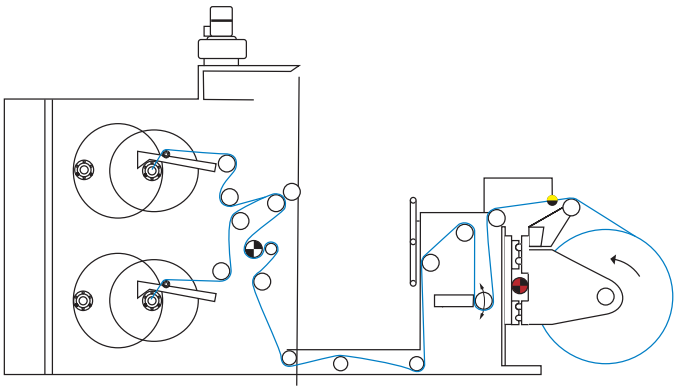
Technical data

WSB90 winding station system	
Positional accuracy	< ± 0.2 mm (material-dependent)
Error frequency	Max. 2 Hz
Nominal actuating travel	±25/50/75/100 mm
Nominal actuating speed	Max. 30 mm/s
Nominal actuating force	800 N
Ambient temperature	+10 °C to +50 °C
Storage temperature	-20 °C to +80 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage Nominal value Nominal range Nominal range with power supply	 24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 2.2 A DC (manual sensor positioning)
Fieldbus interface, optional	Ethernet UDP, Ethernet/IP
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU 72170613 03 (AG 90) NRTL certificate CU 72170249 03 (DO 32)
Protection class	IP 54

Selection table

Actuating drive AG 90		
Type	Nominal actuating travel (mm)	Nominal actuating force (N)
AG 9003	±25	800
AG 9013	±50	800
AG 9023	±75	800
AG 9033	±100	800

Mounting parts for AG90 (Mat. No. 833252)



ELWINDER WSB90 on slitter rewinder

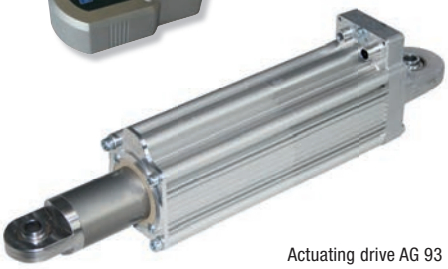
EL.NET
Brush-less drive technology

WSB91/WSB93 winding station system

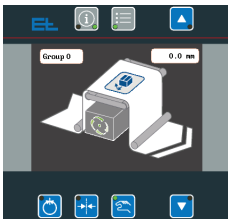
- Control components for winding stations with wear-free, brushless drive technology for highest control accuracy and control dynamics
- Can be combined with various sensors
  - FR 52 infrared edge sensor for non-woven fabrics
  - FX 42/52 ultrasonic edge sensor for paper and transparent plastic materials
  - FE 52 color line sensor for printed webs with line or color contrasts
- Optionally with VS 80 motorized sensor positioning for rapid format changing
- Integrated digital controller with position, speed and current controller for highest quality of control
- Can be connected to EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser
- Optionally with functional safety in accordance with EN IEC 61508 with SIL3 and EN ISO 13849-1 in Performance Level d, category 3

FE 52 color line sensor with DO 4021

DN 40 data network center



Actuating drive AG 93



DO 42 command station

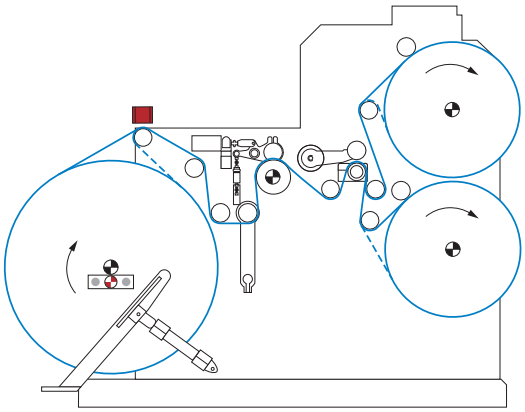
Technical data

WSB91/WSB93 winding station system	
Positional accuracy	< ± 0.2 mm (material-dependent)
Error frequency	Max. 2 Hz
Nominal actuating travel	See table
Nominal actuating speed	Max. 30 mm/s (AG 93), max. 60 mm/s (AG 91)
Nominal actuating force	1000 N (AG 91), 3000 N (AG 93)
Ambient temperature	+10 °C to +50 °C (AG91/93 +10 °C to +60 °C)
Storage temperature	-20 °C to +80 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage Nominal value Nominal range Nominal range with power supply	 24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 5.5 A DC (AG 91 with manual sensor positioning) Max. 8.3 A DC (AG 93 with manual sensor positioning) Max. 7.4 A DC (AG 91 with motorized sensor positioning) Max. 9.5 A DC (AG 93 with motorized sensor positioning)
Fieldbus interface, optional	Ethernet UDP; Ethernet/IP; Profinet
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU 72170613 04 (AG 91/93) NRTL certificate CU 72210743 02 (DN 40)
Protection class	IP 54

Selection table

AG 9 actuating drive		
Type	Nominal actuating travel (mm)	Nominal actuating force (N)
AG 9103	±25	1000
AG 9113	±50	1000
AG 9123	±75	1000
AG 9133	±100	1000
AG 9313	±50	3000
AG 9333	±100	3000
AG 9343	±150	3000
AG 9353	±200	3000

Mounting parts for AG 9 (Mat. No. 472974)



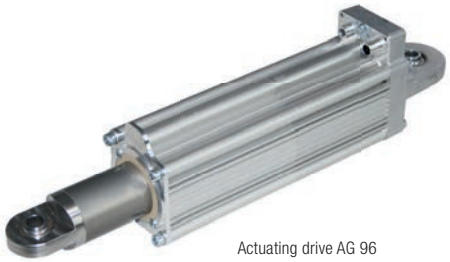
ELWINDER WSB91 on slitter rewinder

Winding station system WSB96*

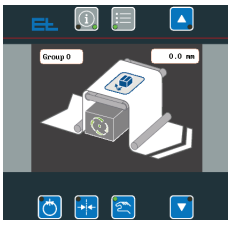
- Control components for winding stations with wear-free, brushless drive technology for highest control accuracy and control dynamics
- Can be combined with various sensors
  - FR 52 infrared edge sensor for non-woven fabrics
  - FX 42/52 ultrasonic edge sensor for paper and transparent plastic materials
  - FE 52 color line sensor for printed webs with line or color contrasts
- Optionally with VS 80 motorized sensor positioning for rapid format changing
- Integrated digital controller with position, speed and current controller for highest quality of control
- Can be connected to EL.NET control systems via Ethernet in star or line topology
- Optionally with integrated fieldbus interface Ethernet/IP, Ethernet UDP or Profinet
- Simple service and diagnostics option using web-based management with a standard web browser
- Optionally with functional safety in accordance with EN IEC 61508 with SIL3 and EN ISO 13849-1 in Performance Level d, category 3 (in preparation)

FR 52 infrared edge sensor

Data network center DN 40



Actuating drive AG 96



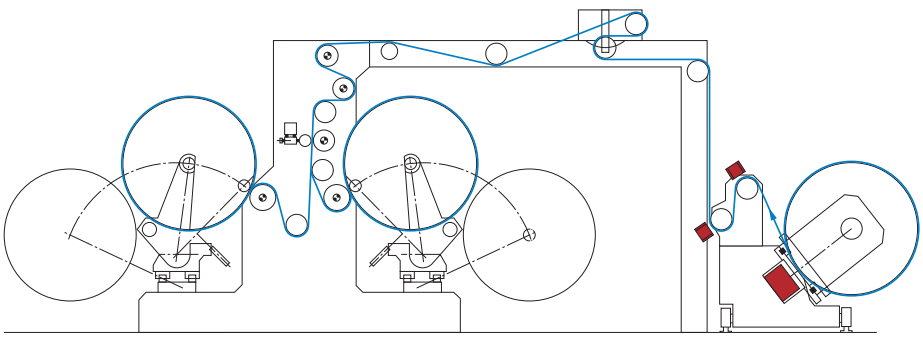
DO 42 command station

Selection table

Actuating drive AG 96		
Type	Nominal actuating travel (mm)	Nominal actuating force (N)
AG 9613	±50	6000
AG 9633	±100	6000
AG 9643	±150	6000
AG 9653	±200	6000

Technical data

WSB96 winding station system	
Positional accuracy	< ± 0.2 mm (material-dependent)
Error frequency	Max. 2 Hz
Nominal actuating travel	See table
Nominal actuating speed	Max. 15 mm/s
Nominal actuating force	6000 N
Ambient temperature	+10 °C to +50 °C (AG96 +10 °C to +60 °C)
Storage temperature	-20 °C to +80 °C
Relative humidity	15 to 95 % (non-condensing)
Operating voltage Nominal value Nominal range Nominal range with power supply	 24 V DC 20 to 30 V DC (ripple included) 100 to 240 V, 50/60 Hz
Current consumption	Max. 10.6 A DC (with manual sensor positioning) Max. 11.8 A DC (with motorized sensor positioning)
Fieldbus interface, optional	Ethernet UDP; Ethernet/IP; Profinet
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU (AG 96) NRTL certificate CU 72210743 02 (DN 40))
Protection class	IP 54



ELWINDER WSB96 on slitter rewinder

* in preparation

Linear actuating drive AG 9..2 with STO

- Linear actuating drive with permanently excited synchronous machine (BLDC motor), particularly suitable for applications with very smooth running and long service life
- With the "Safe Torque Off" (STO) function for functional safety
- High-resolution multiturn encoder to acquire the rotor position and the absolute position
- Absolute position acquisition, even in cases of voltage failure (without buffer battery)
- Space-saving design due to integrated control electronics
- High power density and overload capability
- Integrated temperature monitoring
- Simple configuration via web-based management with standard web browser

SAFETY APPROVED

AG 93.2 actuating drive

Standards	Category	Description
IEC 61508-1: 2010 IEC 61508-2: 2010	SIL 3	Function safety of E/E/PE safety-related systems Part 1: General requirements Teil 2: Requirements for E/E/PE safety-related systems
IEC 61508-5-2: 2016	SIL 3	Adjustable speed electrical power drive systems Part 5-2: Safety requirements - Functional
IEC 62061: 2021	SIL 3	Safety of machinery - Functional safety of safety-related control systems
ISO 13849-1: 2015 ISO 13849-2: 2012	PL d	Safety of machinery - Safety-related parts of control systems Part 1: General principles for design control systems Part 2: Validation

Selection table

Actuating drive AG 9..2 with STO		
Type	Nominal actuating travel (mm)	Nominal actuating force (N)
AG 9102	±25	1000
AG 9112	±50	1000
AG 9122	±75	1000
AG 9132	±100	1000
AG 9312	±50	3000
AG 9332	±100	3000
AG 9342	±150	3000
AG 9352	±200	3000

Mounting parts for AG 9 (Mat. No. 472974)

Technical data

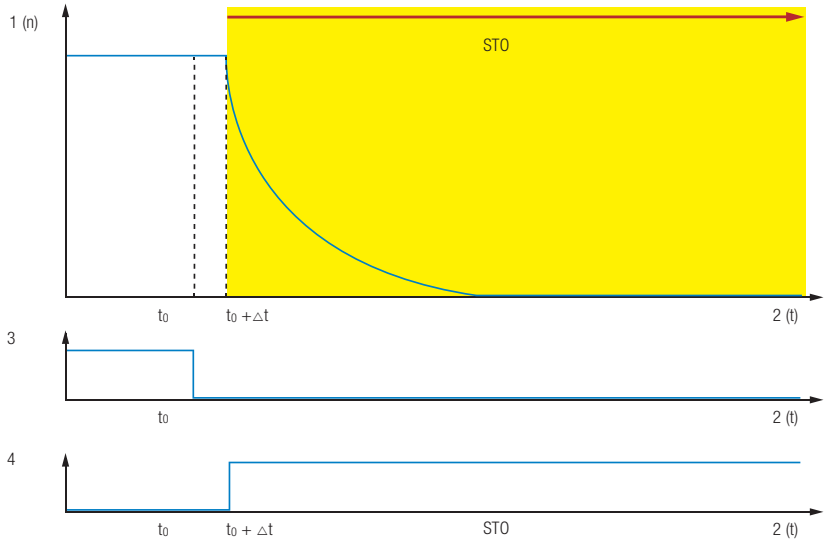
Actuating drive AG 91.2/AG 93.2	
Operating voltage Nominal value Nominal range	 24 V DC 20 to 30 V DC (ripple included)
Nominal current	5.6 A (AG 91.2) 7.7 A (AG 93.2)
Nominal actuating force	1000 N (AG 91) / 3000 N (AG 93)
Nominal actuating speed	Max. 30 mm/s (AG 93.2), max. 60 mm/s (AG 91.2)
Insulation class	F
Resolution multiturn encoder	12 bits/revolution (4096 increments)
Fieldbus	Ethernet UDP / Ethernet/IP / Profinet
Electrical connections	Communication: M8 D-coded, 4-pin Operating voltage: M12 L-coded, 5-pin STO: M8 A-coded, 3-pin
Installation altitude	Max. 3000 m NHN
Ambient temperature	0 to +60 °C
Storage temperature	-20 to +80 °C
Air humidity	15 to 95 % (non-condensing)
Certifications	Declaration of incorporation according to Machinery Directive 2006/42/EC NRTL certificate CU 72170613 04
Protection class	IP 54
Weight	3.4/3.9/4.4/4.5 kg (AG 91.2) 4.7/5.2/5.8/6.4 kg (AG 93.2)

Functional safety

"Safe Torque Off" (STO) function

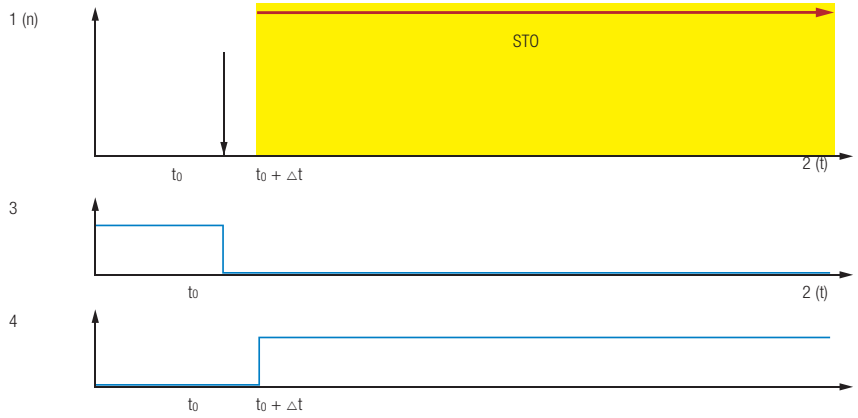
- The safety function STO (Safe Torque Off) according to EN 61800-5-2 is a safety function integrated into the drive; the safety function shuts down the motor torque by interrupting the control pulses. The safety function STO can be used wherever the actuating drive comes to a standstill in a sufficiently short time due to the load torque or due to friction, or where the actuating drive "coasting down" does not have any safety-related consequences. The standstill position is not monitored!
- The safety function STO corresponds to stop category 0 according to EN IEC 60204-1. The figures show the sequence over time of the two application examples for using the STO function. (In the figures, △t identifies the response time of the safety function.)

STO activation in operation



Prevention of starting by means of the activation of the STO safety function:
1 Speed (n) / 2 Time (t) / 3 Request (STO input) / 4 Status

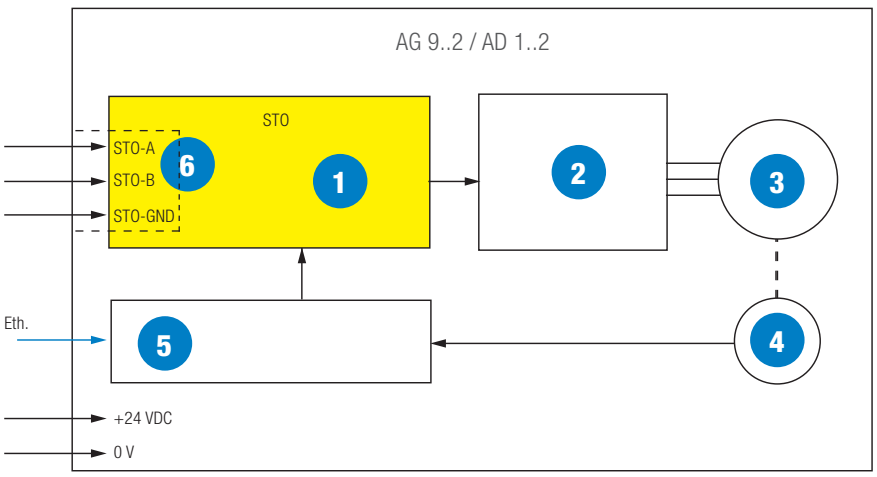
STO activation at standstill



Prevention of starting by means of the activation of the STO safety function:
1 Speed (n) / 2 Time (t) / 3 Request (STO input) / 4 Status

Block diagram (STO)

- The internal layout of the actuating drive is shown as a simplified block diagram in the figure shown. The integrated safety function is marked in yellow. The STO module has a two-channel architecture (channel A and channel B) and in this way achieves Performance Level d, category 3 as per EN ISO 13849-1.
- The two shutdown channels are supplied by the STO-A and STO-B inputs and act on the safe pulse inhibit. If the safety function STO is activated, the control pulses to the power stage, and thus the energy to the motor, are interrupted by the two-channel safe pulse inhibit.



Simplified block diagram of the BLDC drive:
1 Impulse block / 2 Power stage / 3 Motor / 4 Multiturn encoder / 5 Drive control / 6 Galvanic isolation

Questionnaire

General data			
Customer			
Street			
Zip code		City/town	
Country		Internet	
Phone			
Contact person			
Phone		eMail	
Project			

Technical Data					
Type of machine					
Make					
Position on the machine					
Web type	❑ Paper	❑ Cardboard	❑ Film/foil	❑ Metal	❑ Rubber
	❑ Textile	❑ Carpet	❑ Non-woven fabric	❑	
Web surface	❑ Transparent	❑ Not transparent		❑	
Web width	Min _____mm		Max. _____mm		
Web weight	Min _____g/m²		Max. _____g/m²		
Web speed	Min _____m/min		Max. _____m/min		
Web tension	Min _____N		Max. _____N		
Condition in operation	❑ Dry	❑ Moist	❑ Wet	❑	
Ambient temperature	_____°C				
Ambient conditions	❑ Dry	❑ Dusty	❑ Wet	❑	
Infeed error	+/- _____mm				
Error frequency	_____Hz				
Operating voltage	❑ 24 V DC	❑ _____V		❑ _____Hz	

Application

Technical specifications				
Type of control	❑ By web edge	❑ Manual positioning	❑ Motorized positioning	
	❑ By line	❑ Manual positioning	❑ Motorized positioning	
	❑ By web center	❑ Manual sensor positioning ❑ Motorized symmetrical sensor positioning ❑ Motorized asymmetrical sensor positioning		
	❑ Laminating	❑ By web edge with manual positioning ❑ By web edge with two sensors on a motorized support ❑ By web edge with two sensors and two support beams		
	❑ Oscillation	❑ With sensor	❑ Without sensor	+/-_____mm
	❑ Width measurement	Measuring accuracy +/-_____mm		
Sensor	❑ Ultrasonic	❑ Infrared	❑ Line	

❑ Pivoting frame system ELGUIDER	Nominal width	NW _____mm	Transfer length LÜ _____mm	
	Assembly dimension	M _____mm		
	Roller diameter	D _____mm		
	Roller material	❑ aluminum	❑ steel	❑
	Roller surface	❑ With internal bearing	❑ With outer bearing	
	Roller surface	Infeed	❑ Bare	❑ Cork ❑
		Exit	❑ Bare	❑ Cork ❑

❑ ELROLLER steering roller system	Nominal width	NW _____mm		
	Assembly dimension	M _____mm		
	Version	❑ 1 roller (90° wrapping)	❑ 2 rollers (S wrapping)	
	Roller diameter	D _____mm		
	Roller material	❑ Aluminum	❑ steel	❑
	Roller surface	❑ With internal bearing	❑ With outer bearing	
	Roller surface	Infeed	❑ Bare	❑ Cork ❑
		Exit	❑ Bare	❑ Cork ❑

❑ ELTURNER turning bar system	Turning bar	Nominal width	_____mm	❑ Diameter	_____mm
	Version	❑ Web deflection to the right		❑ Web deflection to the left	
	Surface	❑ Chrome-plated		❑ Pneumatically ventilated	
	Assembly dimension	M _____mm			
	Nominal width infeed and outfeed roller	NW _____mm			
	Roller material	❑ Aluminum	❑ steel	❑	
	Roller surface	❑ With internal bearing		❑ With outer bearing	
	Roller surface	Infeed	❑ Bare	❑ Cork	❑
		Exit	❑ Bare	❑ Cork	❑

Questionnaire

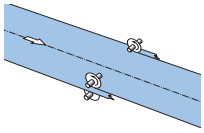
Technical specifications					
❑ **ELWINDER winding station system**	Version	❑ Unwinding		❑ Winding	
	Bearing	❑ Plain bearing	❑ Linear bushing	❑ Roller bearing	❑
	Friction factor	_____			
	Weight winding station	_____ kg			
	Actuating travel	+/- _____ mm			
	Cable length between AG 9 actuating drive and DN 40 data network center	❑ 5 m	❑ 10 m	❑ 20 m	❑
	Cable length between AG 9 actuating drive and DO 32 command station	❑ 5 m	❑ 10 m	❑ 20 m	❑

Operation	Command station	❑ with DO 42	❑ with DO 32	❑ Without	
	Assembling	❑ Front panel installation	❑ Wall mounting		
	Cable length between DN 40 data network center and DO 42 command station	❑ 5 m	❑ 10 m	❑ 20 m	❑
Networking		❑ Series networking		❑ Star networking	
Interface	❑ With interface		❑ Without interface		
	❑ Digital I/O	❑ Ethernet UDP	❑ Ethernet/IP	❑ Profinet	❑

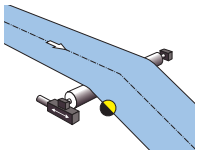
Comments

Date	Issuer

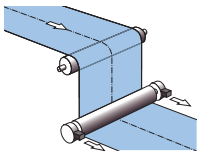
Other products for the printing and film industry



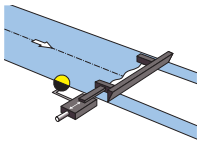
ELCUT – Web cutting systems



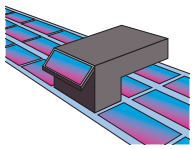
ELBANDER – Fabric position control systems



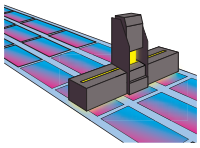
ELTENS – Web tension control systems



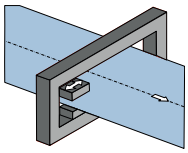
ELPOSER – Positioning and follow-up control systems



ELSCAN – Web monitoring systems



SMARTSCAN – Print inspection systems



ELTIM – Surface weight measuring systems

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