



ELGUIDER

**Web guiding systems
with compact pivoting frame**

Continuous acquisition
and control of the web position



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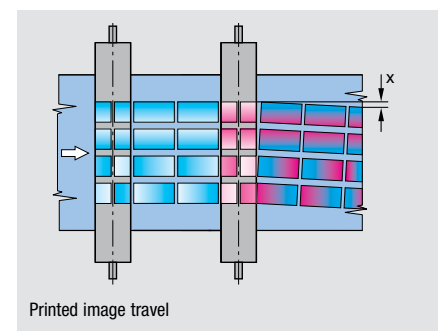
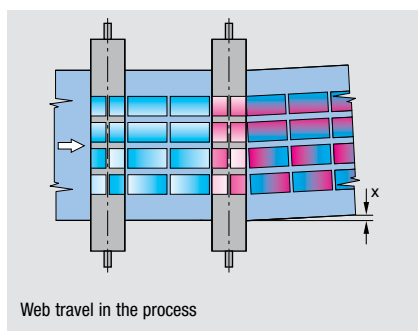
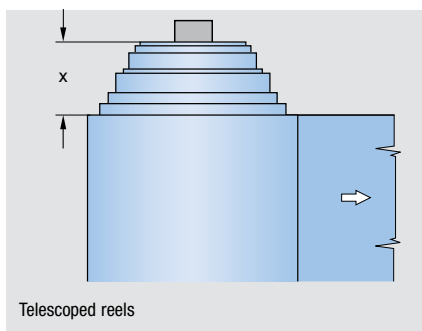
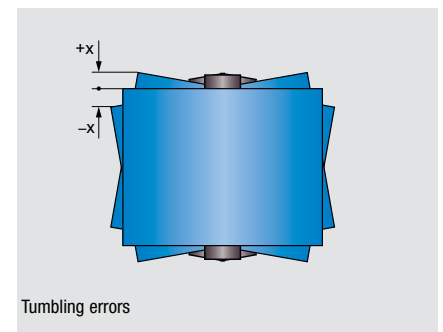
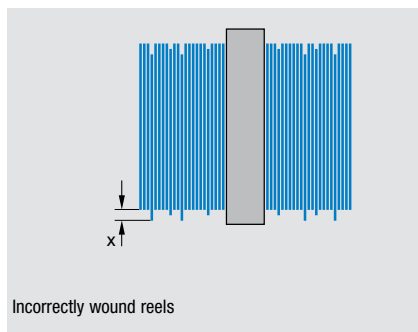
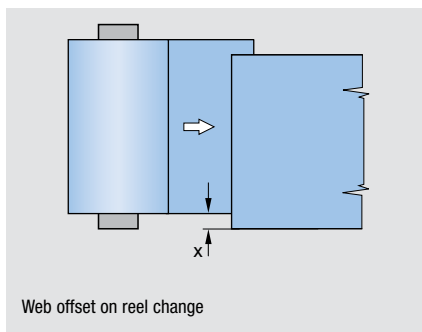
Web guiding systems for improved quality and productivity

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!

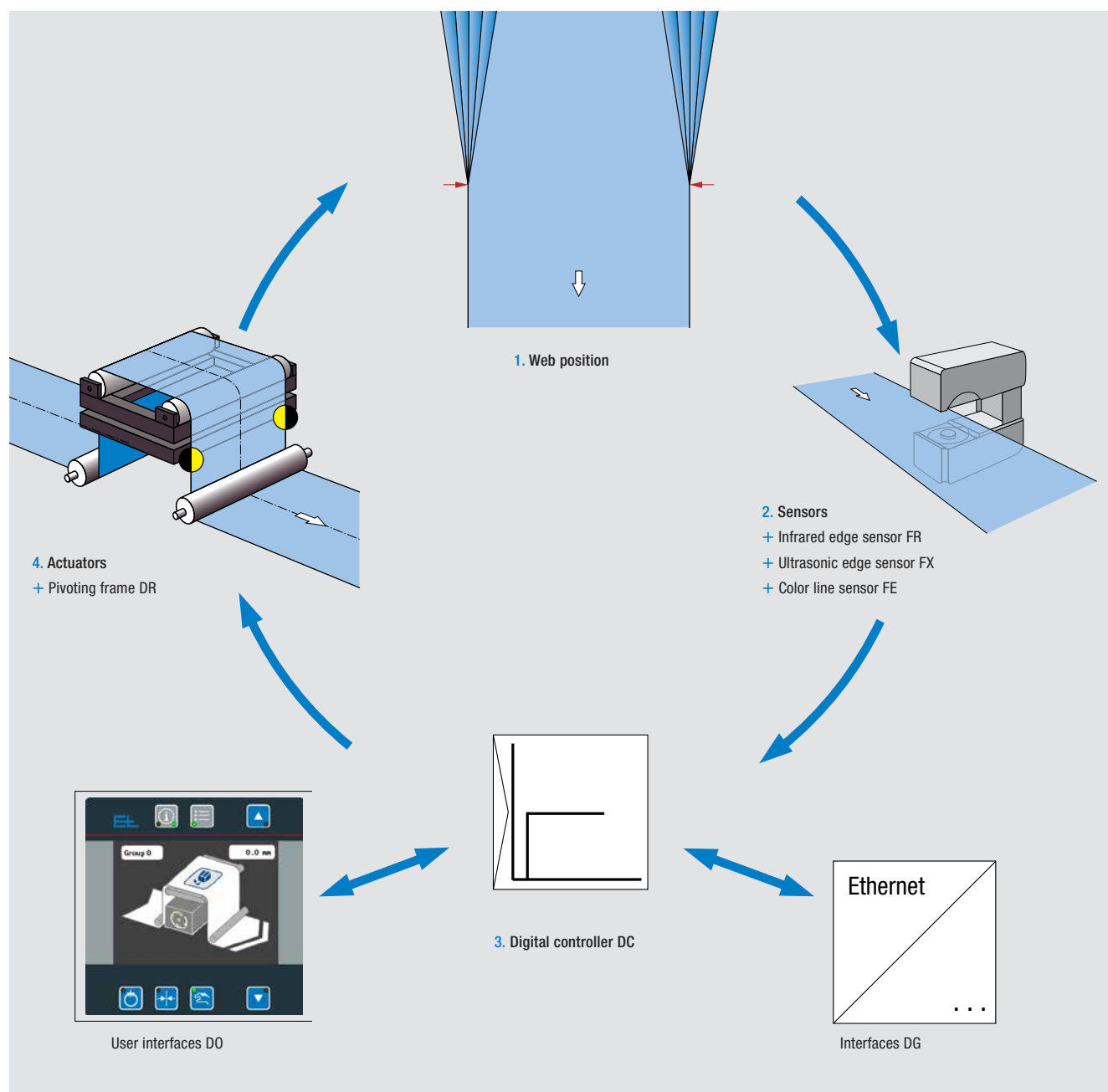
Typical position errors



The control loop

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

1. The starting point is the actual 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 infrared, 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.



Benefits of ELNET-systems

Digital system



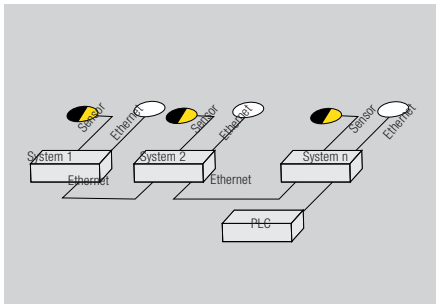
- + Continuous, digital web guiding system
- + No drifting through analog signals
- + No analog transmission paths

Web-based management



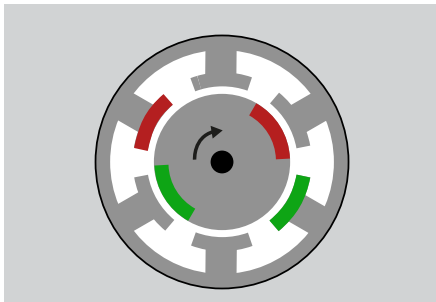
- + Commissioning and service with every standard browser
- + No firmware (special software) required
- + User-friendly display of the configuration

Ethernet networking



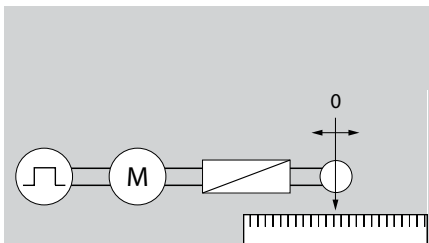
- + Maximum 255 participants
- + Increased data rate of up to 100 Mbit/s
- + Self-organizing system

Brush-less drive technology



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

Absolute position detection



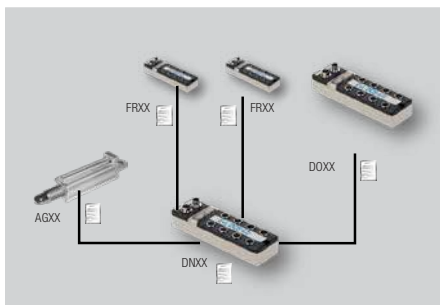
- + Absolute actuator position is always available - no reference run required
- + No reference sensor
- + No position loss on power off

Controller and output stage integrated in the actuator



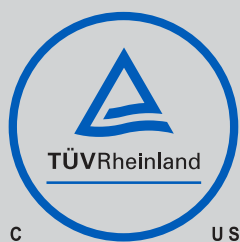
- + Space saving
- + Minimized wiring effort

Self-healing



- + Automatic configuration recovery for problem-free exchange of control components

Certifications



- + Certified for USA and Canada
- + NRTL certificate CU72180310 01

Infrared edge sensor FR 46

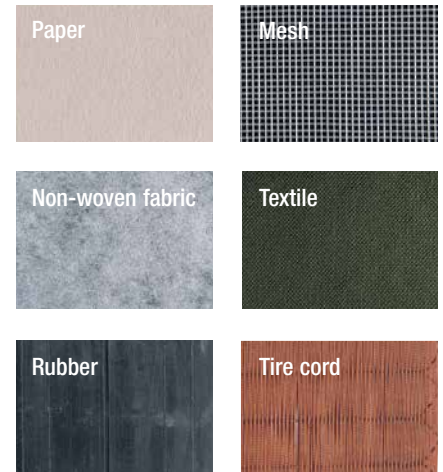
Infrared edge sensor FR 46

- + 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



Infrared edge sensor FR 46

Material sample



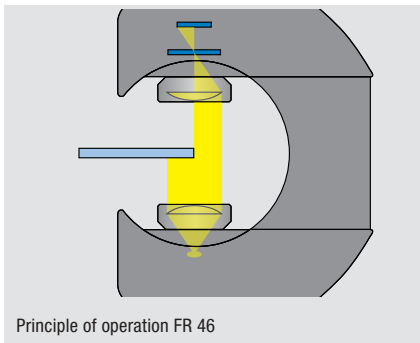
Scan, edge scanning



Scan, thread scanning



Infrared edge sensor FR 46 on non-woven fabric edge



Principle of operation FR 46

Technical data

Infrared edge sensor FR 46	
Operating voltage	24 V DC
Nominal value	20 to 30 V DC
Nominal range (ripple included)	50 mA DC
Current consumption	+10 to +50 °C
Ambient temperature	15 to 95 % (non-condensing)
Relative atmospheric humidity	± 2.5 mm
Measuring range	0.01 mm
Resolution	± 0.2 mm
Linearity	880 nm
Wavelength	200 Hz
Scan rate	Max. 10 m
Cable length	IP 54
Protection class	0.2 kg
Weight	Min. 0.1 bar; max. 0.2 bar
Air purge system operating pressure	5 μ m
Service unit filter	< 0.01 mg/m ³
Service unit residual oil content	30 mm
Fork width	77 x 27 x 93 mm
Dimensions (L x W x H)	

Infrared edge sensor FR 52

Infrared edge sensor FR 52

- + 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 clearing device in case of extreme dust conditions
- + Bar display for the indication of the current edge position or diagnostic information



Infrared edge sensor FR 52



Infrared edge sensor FR 52 for mesh acquisition



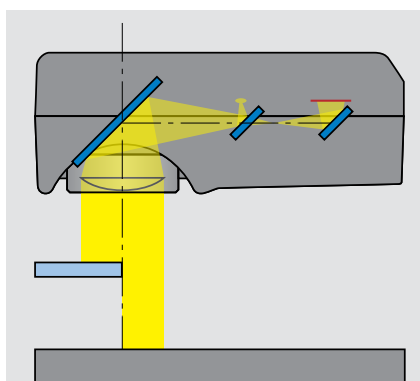
FR 52 with reflector bar

Selection table

Reflector bar	
Type	Fork width (mm)
FR_5000-95	30
FR_5000-97	75
FR_5000-98	160

Technical data

Infrared edge sensor FR 52	
Operating voltage	24 V DC
Nominal value	20 to 30 V DC
Nominal range (ripple included)	80 mA DC
Current consumption	+10 to +50 °C
Ambient temperature	15 to 95 % (non-condensing)
Relative atmospheric humidity	± 10 mm
Measuring range	0.02 mm
Resolution	± 0.1 mm
Linearity	850 nm
Wavelength	200 Hz
Scan rate	Max. 10 m
Cable length	IP 54
Protection class	0.3 kg
Weight	Min. 0.1 bar; max. 0.2 bar
Air purge system operating pressure	5 μ m
Service unit filter	< 0.01 mg/m ³
Service unit residual oil content	See selection table
Fork width	105 x 50 x 40 mm
Dimensions (L x W x H)	



Principle of operation FR 52

Infrared wide band sensor FR 61

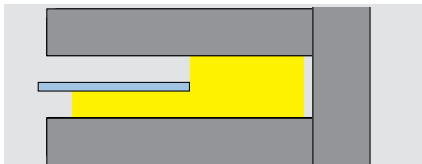
Infrared wide band sensor FR 61

- + 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 loads
- + Display of the current edge position and diagnostic information

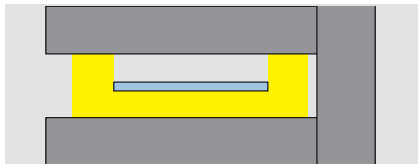


Infrared wide band sensor FR 61

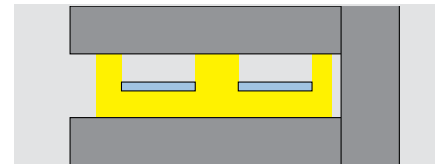
Edge configurations



- + Acquisition and evaluation of a web edge

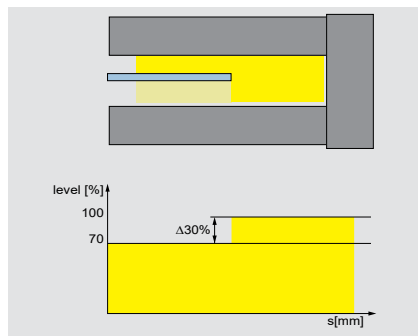


- + Acquisition and evaluation of two web edges
- + Application for webs from 4 to 450 mm



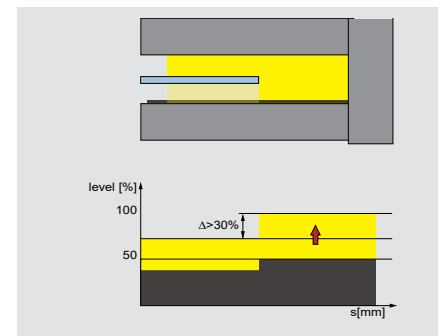
- + Acquisition and evaluation of four web edges
- + Application for two webs from 4 to 220 mm

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 in case of heavy dust deposits

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)	100	with
FR 6106	FR 6206	320 (+/-160)	100	with
FR 6107	FR 6207	480 (+/-240)	100	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)	100	without
FR 6116	FR 6216	320 (+/-160)	100	without
FR 6117	FR 6217	480 (+/-240)	100	without

Technical data

Measuring range	±80/±160/±240 mm	
Fork width CW	40/100 mm	
Resolution	0.01 mm	
Linearity	+/-0.3 mm (measuring range 160/320 mm) +/-0.4 mm (measuring range 480 mm)	
Reproducibility	±0.1 mm	
Wavelength	880 nm	
Scan rate	1000 Hz (≤ 1 ms)	
Evaluation, edge number	Max. 4 edges (2 webs)	
Commissioning/Configuration	Using web-based management	
Operating voltage nominal value nominal range	24 V DC 20 to 30 V DC (ripple included)	
Current consumption	150 mA	
Interface	Sensor CAN	
FR 62	Ethernet PoE (Power over Ethernet)	
FR 61		
Fieldbuses	Ethernet UDP, Ethernet IP	
Electrical connection	M 8 plug socket 6-poles (sensor CAN), M 8 plug socket 4-pole (Ethernet PoE)	
Cable length	Max 10 m (sensor CAN)	
Air purge system operating pressure	2 bar	
Air purge system air consumption	1.55 m³/h (at 2 bar)	
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 atmospheric humidity	15 to 95 % (non-condensing)	
Protection class	IP 54	
Dimensions (L x W x H)	Measuring range ±80 mm Clear width 40 mm ±160 mm Clear width 40 mm ±240 mm Clear width 40 mm ±80 mm Clear width 100 mm ±160 mm Clear width 100 mm ±240 mm Clear width 100 mm	226 x 115 x 32 mm 386 x 115 x 32 mm 546 x 115 x 32 mm 226 x 175 x 32 mm 386 x 175 x 32 mm 546 x 175 x 32 mm

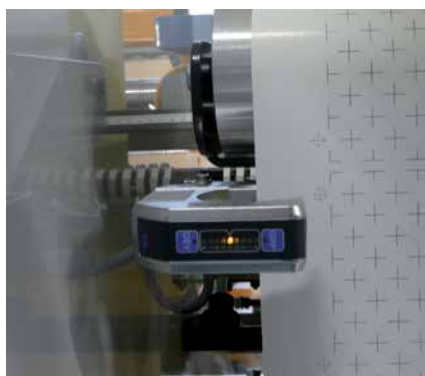
Ultrasonic edge sensor FX 46

Ultrasonic edge sensor FX 46

- + 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



Ultrasonic edge sensor FX 46

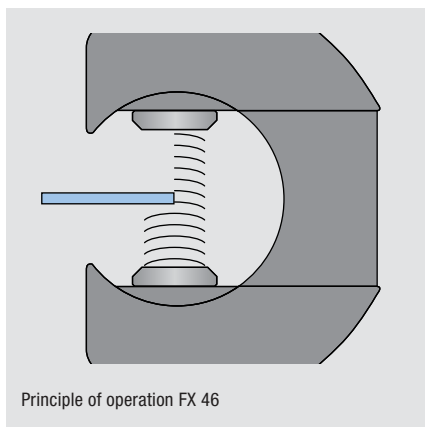


Ultrasonic edge sensor FX 46 at paper edge

Technical data

Ultrasonic edge sensor FX 46

Operating voltage	24 V DC
Nominal value	20 to 30 V DC
Nominal range (ripple included)	
Current consumption	80 mA DC
Ambient temperature	+10 to +50 °C
Relative atmospheric humidity	15 to 95 % (non-condensing)
Measuring range	± 3 mm
Linearity deviation (measuring range 10 – 90 %)	± 1 %
Ultrasonic frequency	~ 200 kHz
Resolution	0.02 mm
Scan 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



Principle of operation FX 46

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 5 in film manufacturing machine



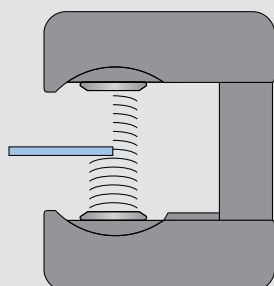
Ultrasonic edge sensor FX 52



Ultrasonic edge sensor FX 42

Selection table

Ultrasonic edge sensors FX 4/5		
Type	Measuring range $\pm$ (mm)	Fork width CW (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



Principle of operation FX 42

Technical data

Ultrasonic edge sensor FX 4/5	
Operating voltage	24 V DC
Nominal value	20 to 30 V DC
Nominal range (ripple included)	170 mA DC
Current consumption	+10 to +50 °C
Ambient temperature	15 to 95 % (non-condensing)
Relative atmospheric humidity	See selection table
Measuring range	± 1 %
Linearity deviation (measuring range 10 – 90 %)	~ 200 kHz
Ultrasonic frequency	0.02 mm
Resolution	200 Hz
Scan rate	Max. 10 m
Cable length	IP 54
Protection class	0 to 3000 m above sea level
Installation altitude	0.7 kg
Weight	See selection table
Fork width	105 x 50 x (CW + 80 mm)
Dimensions (L x W x H)	

Color line sensor FE 52 with DO 4021

Color line sensor FE 52

- + 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

Command station DO 4021

- + 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)

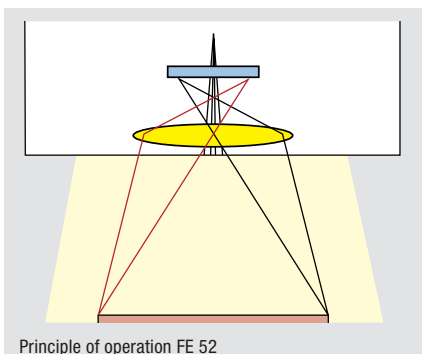


Color line sensor FE 52 with DO 4021

Technical data



Color line sensor FE 52 on roller inspection machine



Principle of operation FE 52

Color line sensor FE 52

Operating voltage, nominal value	24 V DC (20 to 30 V DC)
Current consumption	300 mA DC
Ambient temperature	+10 to +50 °C
Relative atmospheric humidity	15 to 95 % (non-condensing)
Measuring range	±10 mm
Resolution	0.02 mm
Distance sensor – web	28 mm, ±2 mm
Interface	Sensor CAN Ethernet PoE to command station DO 4021
Scan 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

Command station DO 4021

Operating voltage	is supplied with power by the FE 52 color line sensor via PoE (Power over Ethernet)
Current consumption	200 mA DC
Ambient temperature	+10 to +50 °C
Relative atmospheric humidity	15 to 95 % (non-condensing)
Display resolution	320 x 240 pixels
Interface	Ethernet PoE
Length of cable to FE 52	Max. 20 m
Protection class	IP 54
Weight	0.5 kg
Dimensions (L x W x H)	100 x 100 x 34 mm

Guiding criteria

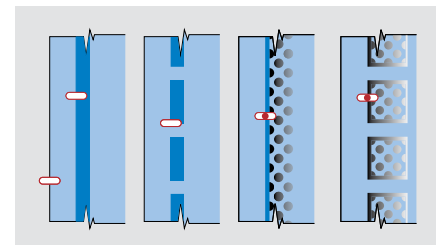
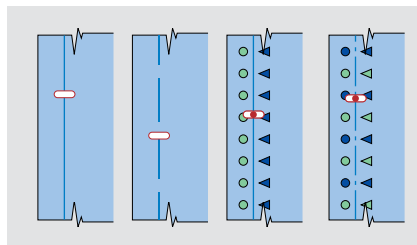
- + Line scanning, light line on dark background
- + Line scanning, dark line on light background
- + Contrast scanning

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 - 8 mm (nominal width 2 - 3 mm)
- + Background width on both sides minimum 1 mm
- + Field of view can be restricted to double line width

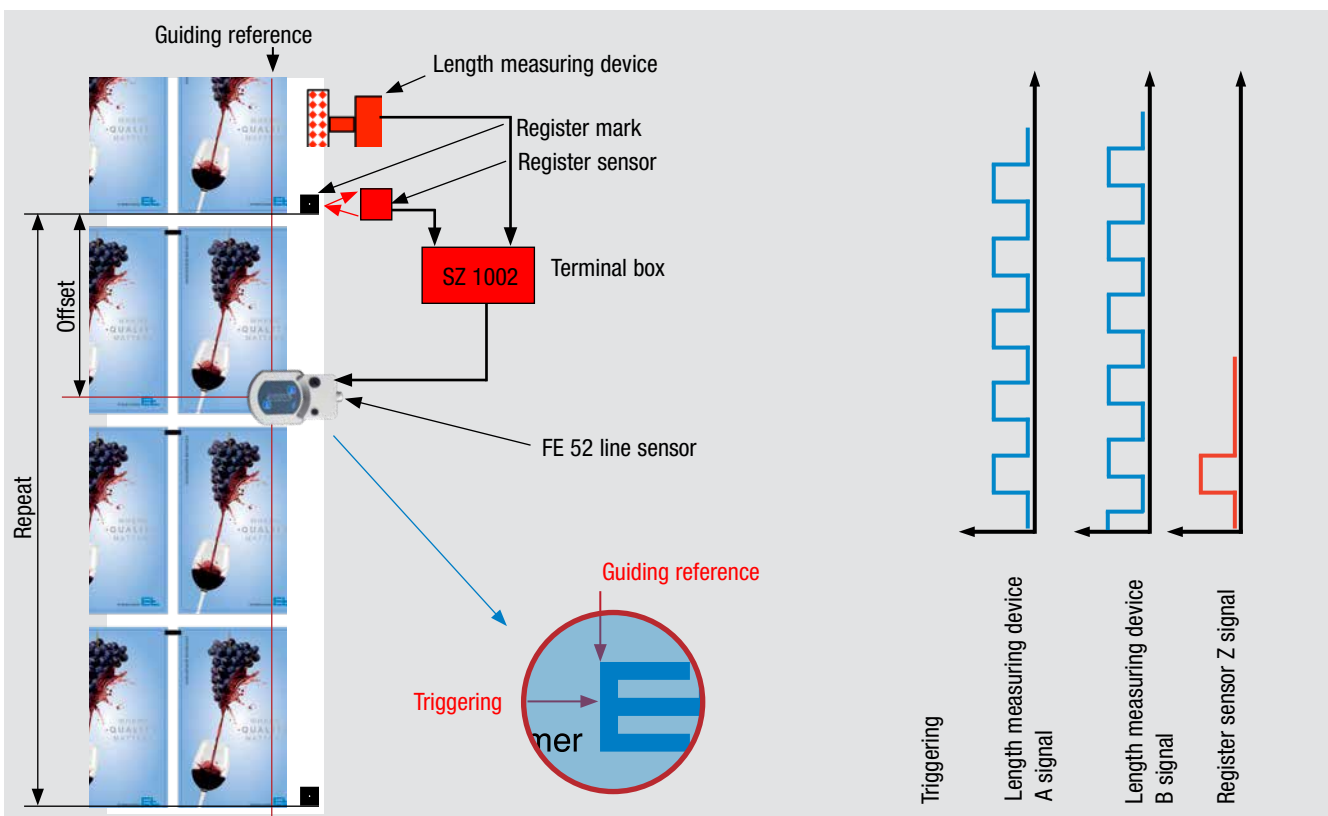
Contrast scanning

- + 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.

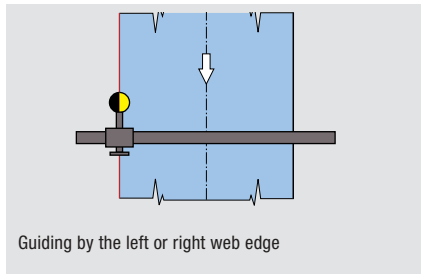


Position control methods

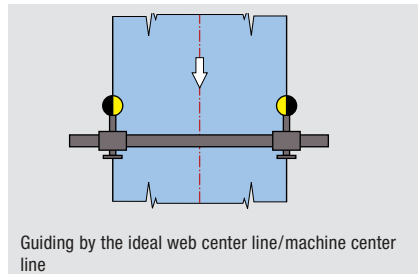
Web guiding is initially defined by the type of web processed. Unfinished fabric webs may only be guided by the edge as no other regular contrasting characteristics are featured. Finished webs offer a further field of possible

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.

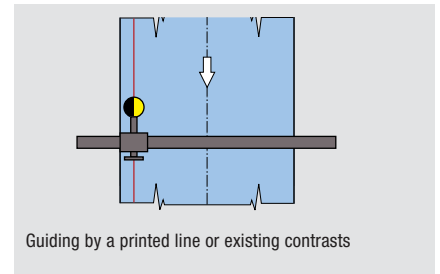
Manual sensor positioning Web edge guiding



Manual sensor positioning Web center guiding



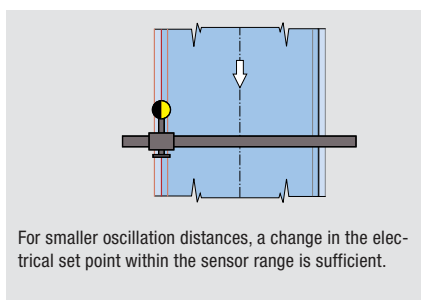
Manual sensor positioning Web contrast guiding



Web oscillation

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

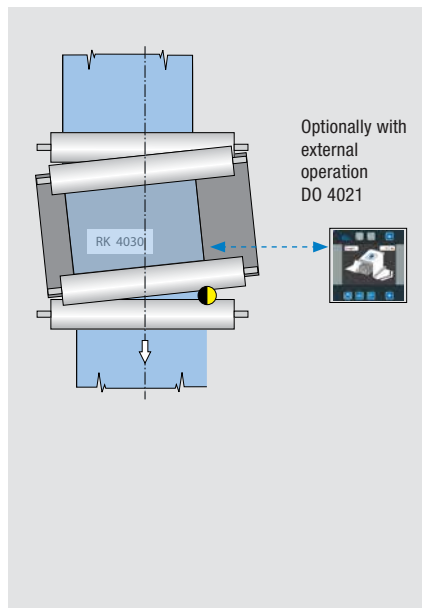
Web oscillation is primarily used for web guiding in front of rewinders.



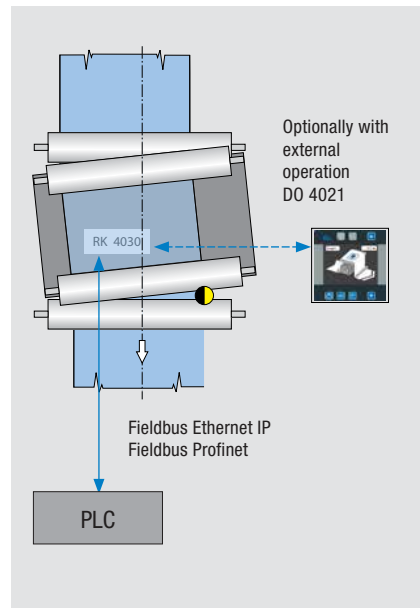
Networking

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

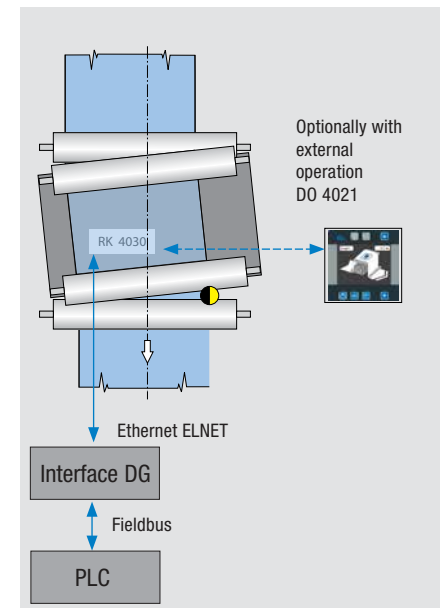
Compact pivoting frame system with operation



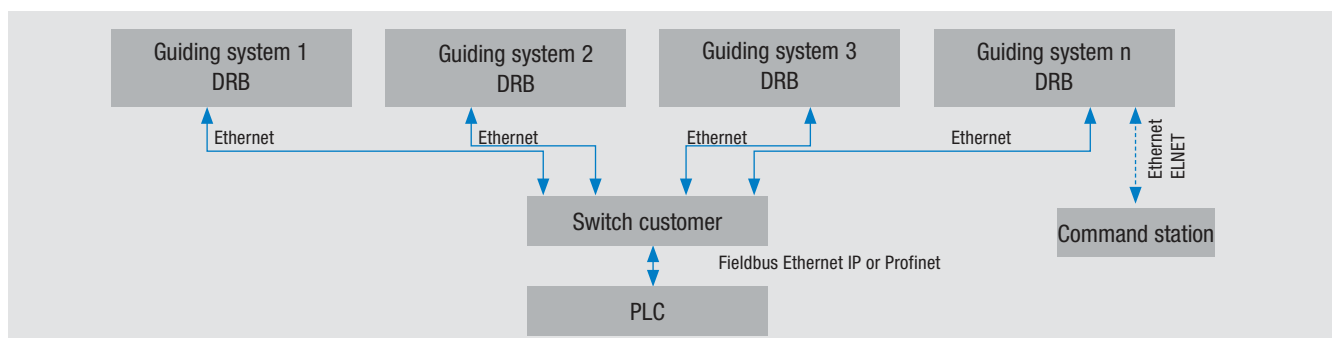
Compact pivoting frame system with standard interface



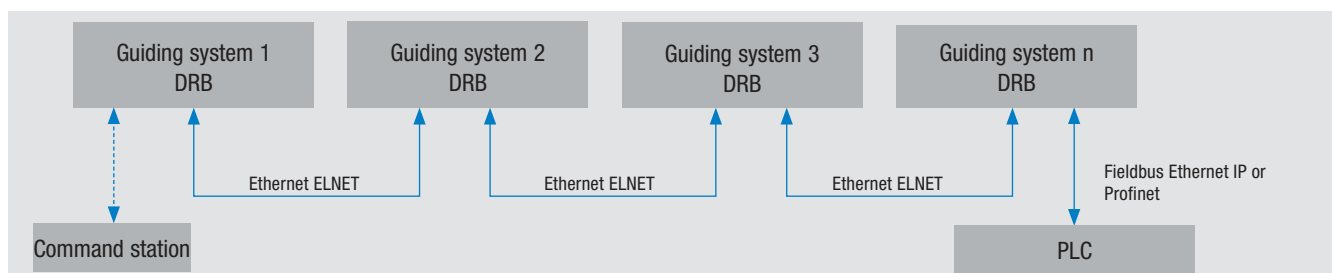
Compact pivoting frame system with interface module



Star networking of multiple web guiding systems

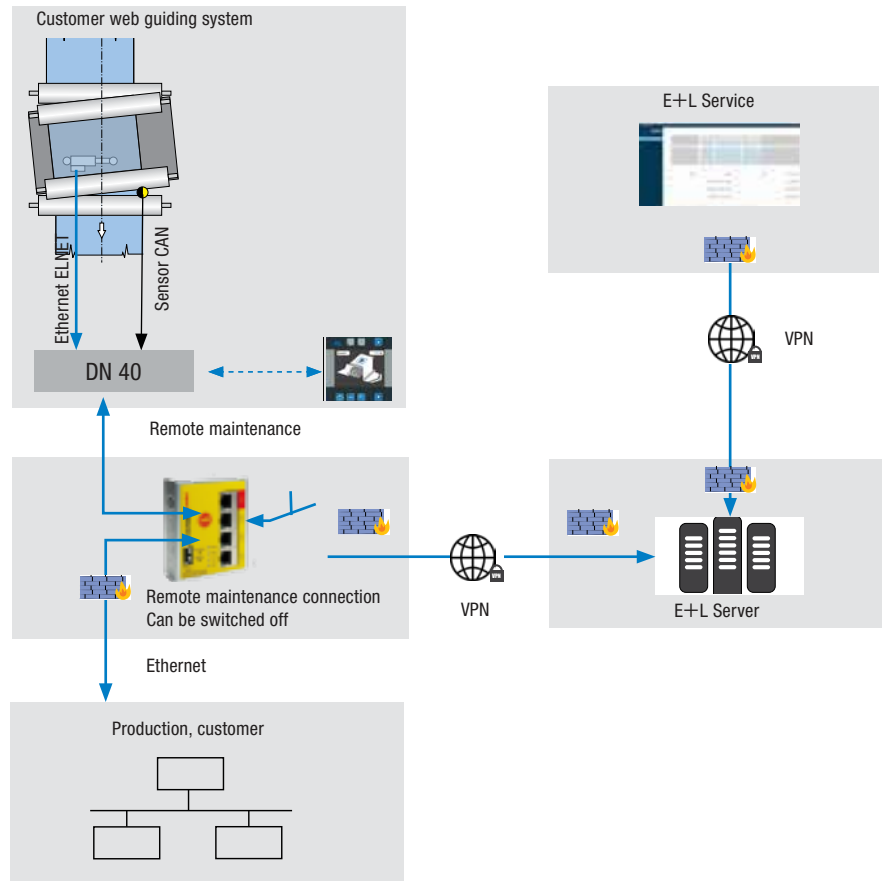


Series networking of multiple web guiding systems



Remote maintenance

- + It is optionally possible to make remote maintenance access available for services
- + All the incoming connections are combined on E+L servers
- + For this, E+L offers three variants:
 - WAN (cabled)
 - 4G (LTE), mobile communications (SIM card required)
 - WiFi (radio-based)
- + Remote maintenance connection can be switched off or disconnected by the customer
- + Secure connections through integrated firewalls and VPN tunnel
- + On administrative 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 4 G(LTE)		1x	1x	
WiFi modem				1x

Technical data

Remote maintenance	
Operating voltage	24 V DC
Nominal value	10 – 30 V DC
Current consumption	250 mA
Area of application	Dry
Ambient temperature	+10 to +50 °C
Storage temperature	-20 to +60 °C
Relative atmospheric humidity	15 – 95 % (non-condensing)
Installation	DIN rail to EN 50022 35 x 7.5 mm
Protection class	IP 20
Weight	240 g
Dimensions (W x T 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)



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)



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)

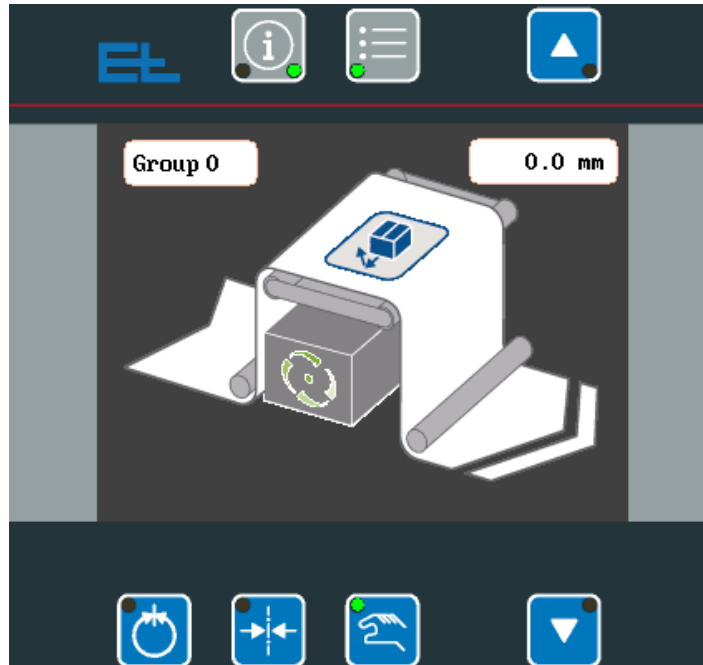
WiFi	IEEE802.11b/g & 802.11n (1T1R mode), to 150 MBit/s
WiFi specification	EU (2.412 GHz-2.472 GHz, 1-13 Channel) · USA (2.412 GHz-2.462 GHz, 1-11 Channel) · WPA/WP2, 64/128/152bit WEP, WPS · 802.11b: 1,2,5.5,11 Mbps · 802.11g: 6,9,12,18,24,36,48,54 Mbps · 802.11n: (20 MHz) MCS0-7, up to 72 Mbps · 802.11n: (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)



Command stations DO 40

Command station DO 40

- + Man-machine interface with intuitive user prompts
- + Visualization and operation of web guiding systems
- + 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
- + User-friendly commissioning due to configuration wizard
- + Language-neutral error messages
- + Integrated PoE (Power over Ethernet) connection



Command station DO 40

Selection table

Command station DO 4		
Type	Panel mounted kit	With housing
DO 4021		■
DO 4023	■	

Technical data

Command stations DO 40	
Operating voltage	Power over Ethernet
Current consumption	200 mA DC
Ambient temperature	+10 to +50 °C
Relative atmospheric humidity	15 to 95 % (non-condensing)
Interface	Ethernet PoE 100 MBit/s
Dimensions	
Front frame panel mounted kit DO 4023	100 x 100 x 9 mm
Cut-out for panel mounted kit	92 x 92 mm
Housing for field assembly DO 4021	100 x 100 x 34 mm
Protection class panel mounted kit (at front)	IP 54
Protection class with housing (for field mounting)	IP 54
Weight	1.3 kg
Language of 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

Interface DG

- + Fieldbus interface with communication mode for connection of ELNET systems to customer controllers
- + Communication modules for flexible implementation of different fieldbus interfaces



Interface DG 0401

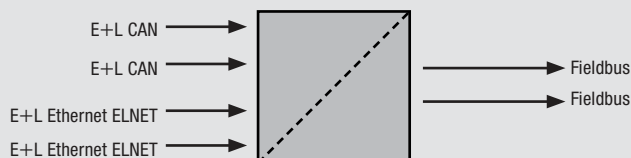
Selection table

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 ELNET system 2x CAN, M16 for CAN-Bus system
Operating voltage	Terminals
Nominal value	24 V DC
Nominal range	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 atmospheric humidity	15 to 95 % (non-condensing)
Mounting	DIN rail to EN 50022 (35 x 7.5 mm)
Dimensions L x W x H	125 x 76 x 110.5
Weight	0.8 kg



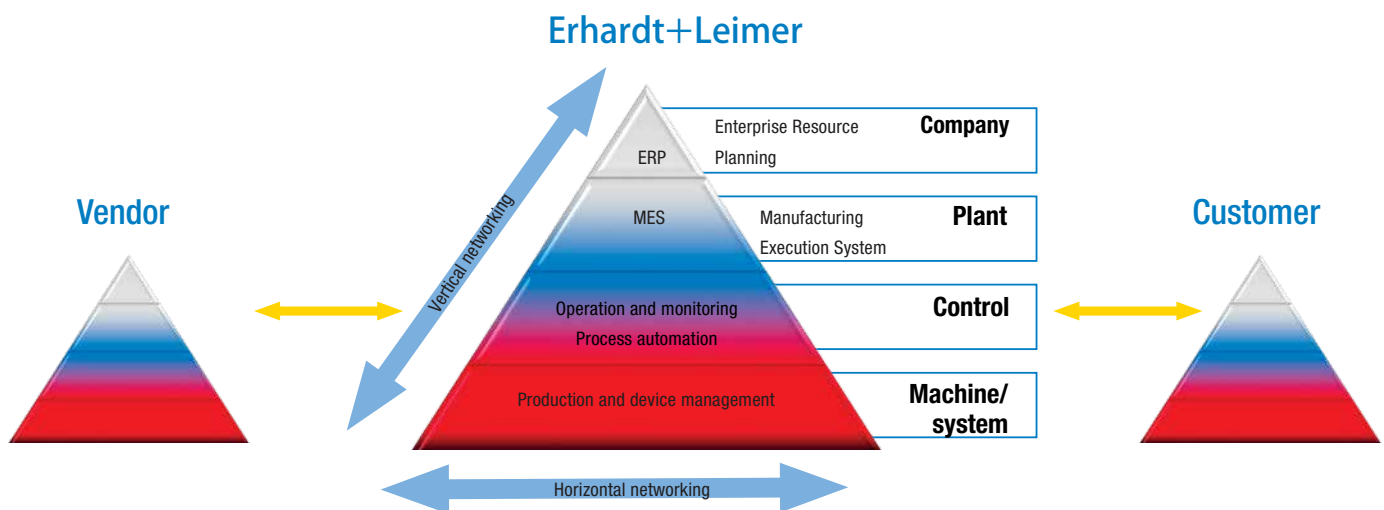
Into the future with Industry 4.0

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. It creates the basis for end-to-end automation of the entire production process - from the cross-machine production sequences to the overriding deli-

very relationships of individual companies within a supply chain. The data acquired at all levels of the production process make up a decisive part of the automation. The generation, selection and evaluation of digital data creates 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.



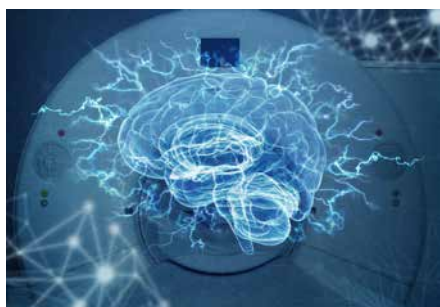
Industry 4.0 at Erhardt+Leimer

Self-healing system



- + Automatic configuration recovery
- + 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

Service and commissioning

- + ELNET components with integrated web server
- + Customer-friendly commissioning with prompts and service via standard web browser
- + The following information can be displayed and configured in the browser:
 - Network overview
 - Control group overview
 - Parameter
 - Sensor signal diagram
 - Actuator position diagrams

Components with web server

Service tool via web browser

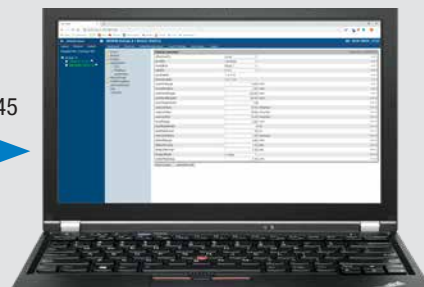


Compact pivoting frame DRB

M8

Ethernet

R45



Pivoting frame system ELGUIDER

Function

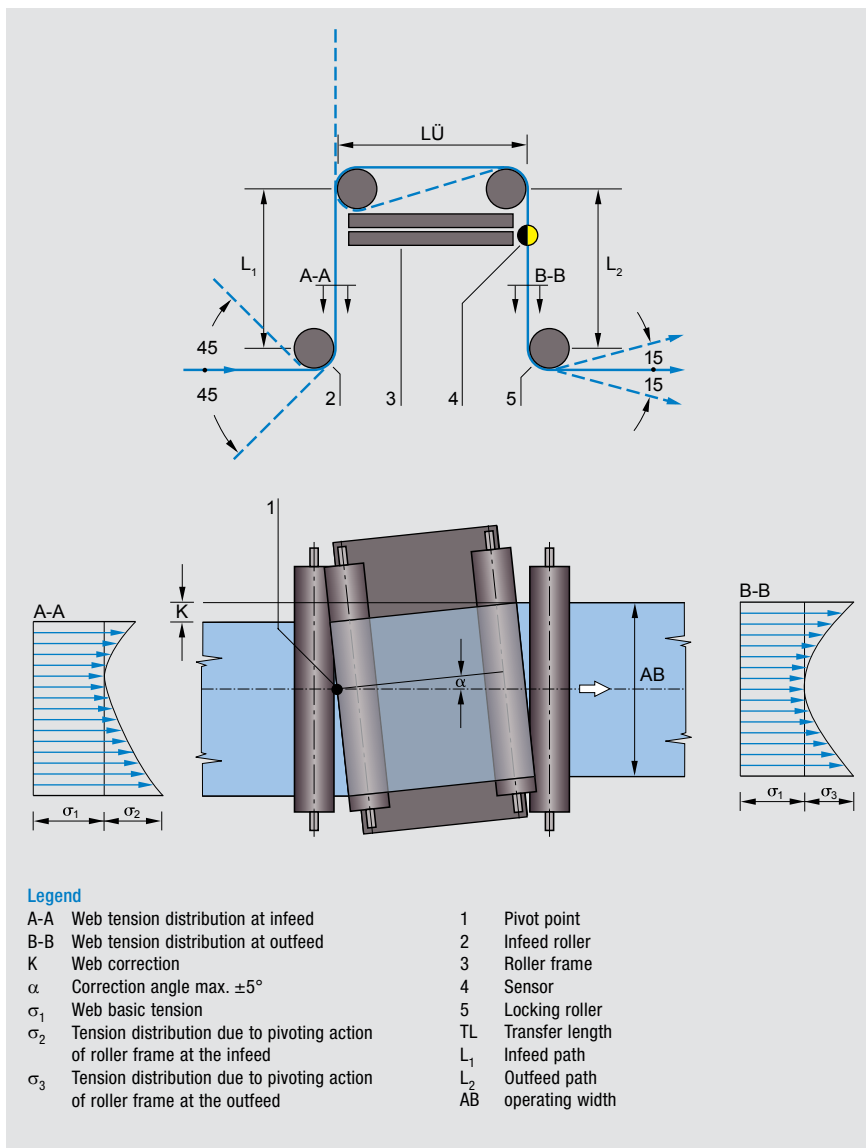
On an ELGUIDER pivoting frame system, the web changes direction four times, each time by 90°. The system is based on a pivoting frame with two path rollers. The imaginary pivot point is located on the infeed plane. Lateral web corrections can only be achieved by swiveling around this pivot point. The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

Area of use

Thanks to optimized exploitation of elasticity ranges, the pivoting frame can be used even in really tight spaces.

Application

The greater the web tension, the module of elasticity and the required correction, the longer the infeed, outfeed 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.



Selection table, network compatibility

	Stand-alone system	Networked system
ELGUIDER DRS10 Eco Line	■	
ELGUIDER DRS20 Eco Line	■	
ELGUIDER DRB14		■
ELGUIDER DRB23		■
ELGUIDER DRB25		■

Pivoting frame system DRS10 (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



ELGUIDER DRS10
with infrared edge sensor FR 43

Selection table

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

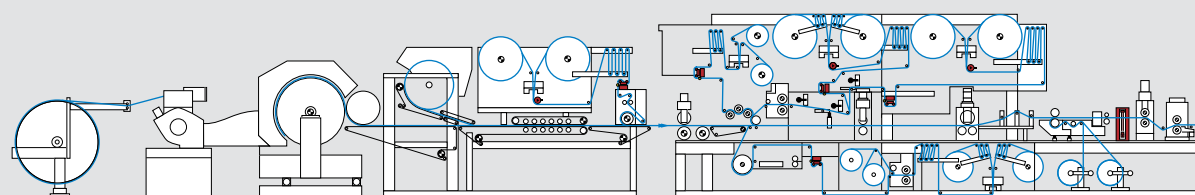
TL = Transfer length, NW = Nominal width



ELGUIDER DRS10 in diaper machine

Technical data

Pivoting frame system DRS10	
Positional accuracy	< 0.15 mm (material-dependent)
Error frequency	2 Hz
Nominal actuating travel	
TL 180 mm	±19 mm
TL 200 mm	±21 mm
Actuating speed TL 180 mm	32 mm/s
Actuating speed TL 200 mm	35 mm/s
Web tension	200 N
Web speed max.	300 m/min
Roller diameter D	
TL 180 mm	40 mm
TL 200 mm	60 mm
Operating voltage	
Nominal value	24 V DC
Nominal range	20 to 30 V DC
Current consumption	Max. 1.5 A DC
Ambient temperature	+10 to +50 °C
Relative atmospheric humidity	15 to 95 % (non-condensing)
Digital I/O interface	5 digital inputs 1 digital output
Certifications	CE conformant (machine 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



ELGUIDER DRS20
with infrared edge sensor FR 43

Selection table

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

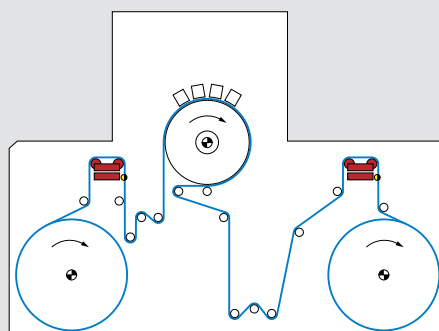
TL = Transfer length, NW = Nominal width



ELGUIDER DRS20 in digital printing machine

Technical data

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



ELGUIDER DRS20 on digital printing machine

Pivoting frame system DRB14

- + 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 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 networked via Ethernet with ELNET control systems in star or row topology
- + Optionally with integrated fieldbus interface Ethernet IP, Ethernet UDP or Profinet
- + Simple service and diagnostics option using web-based management based on a standard web browser
- + Intuitive operation through graphical touch operating panel
- + Optionally with additional command station DO 40



ELGUIDER DRB14 with ultrasonic edge sensor FX 46

Technical data

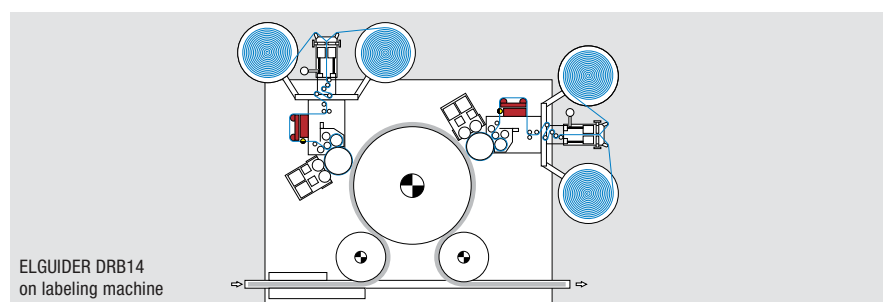
Pivoting frame system DRB14

Positional accuracy FR 46/FX 46/FE 52	< ± 0.1 mm (material-dependent)
Positional accuracy FR 61	< ± 0.2 mm (material-dependent)
Error frequency	Max. 8 Hz
Nominal actuating travel TL 180 mm/200 mm	Max. ±19 mm/Max. ±21 mm
Nominal actuating travel TL 250 mm/300 mm	Max. ±14.5 mm/Max. ±18 mm
Nominal actuating speed at outfeed roller	1 to 170 mm/s
Web tension NW 160/200/250/300/350 mm	Max. 300 N
Web tension NW 400/450 mm	Max. 200 N
Roller diameter D	40/60/80 mm
Ambient temperature	+10 °C to +50 °C
Relative atmospheric humidity	15 to 95 % (non-condensing)
Operating voltage, nominal value	24 V DC
Nominal range	20 to 30 V DC (ripple included)
Nominal range with power supply	100 to 240 V, 50/60 Hz
Current consumption	Max. 4.5 A DC
Interface	Ethernet ELNET protocol
Fieldbus interface, optional	Ethernet UDP Ethernet IP Profinet
Digital I/O interface	5 digital inputs, configurable 1 output, configurable
Certifications	CE conformant (machine directive 2006/42/EC) NRTL certificate CU72180310 01
Protection class	IP 54

Selection table

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

TL = Transfer length, NW = Nominal width



ELGUIDER DRB14 on labeling machine

Pivoting frame system DRB23

- + 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 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 networked via Ethernet with ELNET control systems in star or row topology
- + Optionally with integrated fieldbus interface Ethernet IP, Ethernet UDP or Profinet
- + Simple service and diagnostics option using web-based management based on a standard web browser
- + Intuitive operation through graphical touch operating panel
- + Optionally with additional command station DO 40



ELGUIDER DRB23 with ultrasonic edge sensor FX 46

Technical data

Pivoting frame system DRB23	
Positional accuracy FR 46, FX 46, FE 52	< ± 0.1 mm (material-dependent)
Positional accuracy FR 61	< ± 0.2 mm (material-dependent)
Error frequency	Max. 8 Hz
Nominal actuating travel TL 300 mm/400 mm	Max. ±15 mm
Nominal actuating speed at outfeed roller TL 300 mm/400 mm	1 to 182 mm/s / 1 to 150 mm/s
Web tension	Max. 700 N
Roller diameter D	60/80 mm
Ambient temperature	+10 °C to +50 °C
Relative atmospheric humidity	15 to 95 % (non-condensing)
Operating voltage, nominal value	24 V DC
Nominal range	20 to 30 V DC (ripple included)
Nominal range with power supply	100 to 240 V, 50/60 Hz
Current consumption	Max. 4.5 A DC
Interface	Ethernet ELNET protocol
Fieldbus interface, optional	Ethernet UDP Ethernet IP Profinet
Digital I/O interface	5 digital inputs, configurable 1 output, configurable
Certifications	CE conformant (machine directive v2006/42/EC) NRTL certificate CU72180310 01
Protection class	IP 54

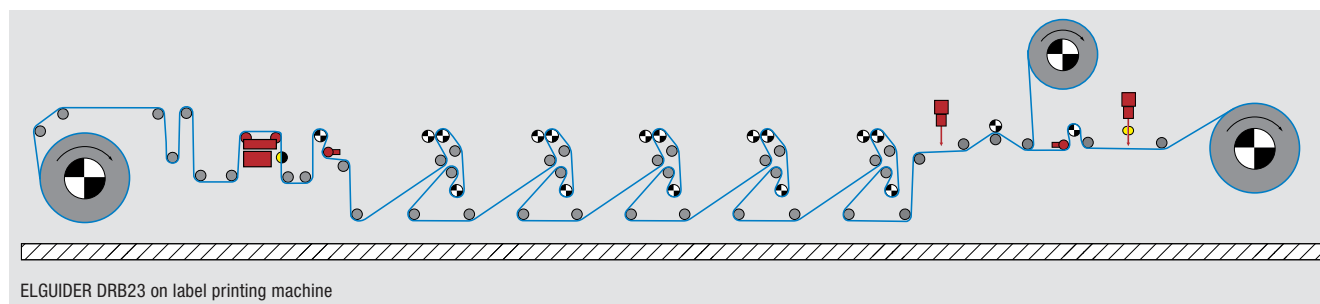
Selection table

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

TL = Transfer length, NW = Nominal width



ELGUIDER DRB23 on label printing machine



ELGUIDER DRB23 on label printing machine

Pivoting frame system DRB25

- + 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 for use in different industries:
 - FR 52 Infrared edge sensor for tissue and non-woven fabric
 - FR 61 Infrared wide band sensor for paper and non-woven 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 networked via Ethernet with ELNET control systems in star or row topology
- + Optionally with integrated fieldbus interface Ethernet IP, Ethernet UDP or Profinet
- + Simple service and diagnostics option using web-based management based on a standard web browser
- + Intuitive operation through graphical touch operating panel
- + Optionally with additional command station DO 40



ELGUIDER DRB25 with ultrasonic edge sensor FX 42

Technical data

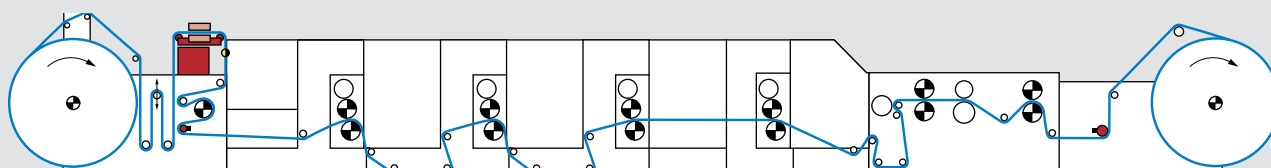
Pivoting frame system DRB25

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	80 mm/s
Web tension	Max. 700 N
Roller diameter	80/100 mm
Ambient temperature	+10 °C to +50 °C
Relative atmospheric humidity	15 to 95 % (non-condensing)
Operating voltage, nominal value	24 V DC
Nominal range	20 to 30 V DC (ripple included)
Nominal range with power supply	100 to 240 V, 50/60 Hz
Current consumption	Max. 5.5 A DC
Interface	Ethernet ELNET protocol
Fieldbus interface, optional	Ethernet UDP Ethernet IP Profinet
Digital I/O interface	5 digital inputs, configurable 1 output, configurable
Certifications	CE conformant (machine directive 2006/42/EC) NRTL certificate CU72180310 01
Protection class	IP 54

Selection table

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

TL = Transfer length, NW = Nominal width



ELGUIDER DRS25 in form printing machine

Questionnaire

General data

Customer			
Street			
Zip code		City/town	
Country		Internet	
Phone		Fax	
Contact person			
Phone		E-mail	
Project			

Technical data

Type of machine					
Make					
Position on the machine					
Web type	☐ Paper	☐ Cardboard	☐ Film/foil	☐ Metal	☐ Rubber
	☐ Textile	☐ Carpet	☐ Non-woven fabric	☐	
Transparency	☐ Transparent	☐ Not transparent		☐	
Web width	Min _____ mm		Max _____ mm		
Web weight	Min _____ g/mm ²		Max _____ g/mm ²		
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	
	☐ By line		☐ Manual positioning	
	☐ By web center		☐ Manual sensor positioning	
	☐ Oscillation	☐ With sensor	☐ Without sensor	+/- _____mm
	☐ Width measurement		Accuracy +/- _____mm	
Sensor	☐ Ultrasonic		☐ Infrared	☐ Line

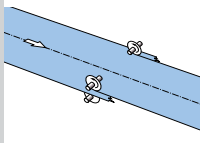
☐ Pivoting frame systems	Nominal width	NW _____mm		
	Transfer length	TL _____mm		
	Assembly dimension M	M _____mm		
	Roller diameter	D _____mm		
	Roller material	☐ Aluminum	☐	
	Roller surface	☐ Infeed	☐ Bare	☐ Cork
		☐ Exit	☐ Bare	☐ Cork

Command station	☐ With command station		☐ Without command station	
	Mounting	☐ Front panel installation	☐ Wall mounting	☐ Console mounting
	Cable length, pivoting frame - command station	☐ 5 m	☐ 10 m	☐ 15 m
Networking	Ethernet	☐ With networking		☐ Without networking
Interface	☐ With interface		☐ Without interface	
	☐ Digital I/O	☐ Ethernet UDP	☐ Ethernet IP	☐ Profinet
	Cable length To interface	☐ 5 m	☐ 10 m	☐ 15 m

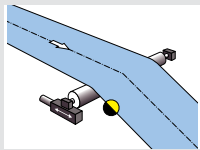
Comments

Date		Issuer	
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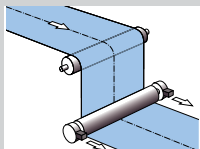
Other products for the paper and film industry



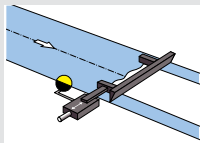
ELCUT – Web cutting systems



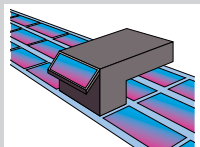
ELBANDER – Conveyor belt control systems



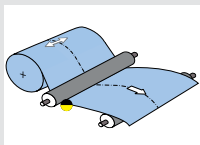
ELTENS – Web tension control systems



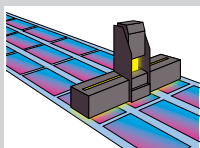
ELPOSER – Positioning and follow-up control systems



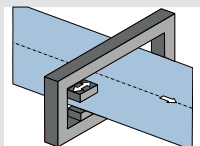
ELSCAN – Web monitoring systems



ELWINDER – Web guiding systems for winding stations (brushless)



SMARTSCAN – Print inspection systems



ELTIM – Thickness measurement systems

Notes

[illegible]

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