DEUTA
Indicating Units

DEUTA-WERKE

Technology under Control

01_2015_EN

Economic efficiency

Safety technology

Modular concept

Obsolescence management

Longevity

» DEUTA indicating units- our modular system...

for your individual requests«

DEUTA indicating units - reliable and flexible

By choosing components of high quality, the indicating units fulfil the highest demands towards reliability, maintainability, safety and longevity. They can be configured in varied ways as to colour design and variability of input variables.

So you will be on the safe side!

»DEUTA indicator units –

Product highlights at a glance!«

- **Holistic**: Deuta controls the entire process chain for your individual indicating units.
- **Flexible**: Three technologies for indicating units: Stepper motor, moving coil instrument, digital indicator
- **Safe**: SIL 2-capable solutions
- **Compatible**: Form-fit-function
- **Rugged**: Regarding extreme environmental conditions
- **High**: The MTBF values

Forward-looking technology

Everything from one source

Consultation, development, layout and selection of components, fitting, testing and production: DEUTA controls the entire process chain from production to qualification and worldwide support.

Platform concept

Three platforms, many possibilities for individualisation.
With just a few components and plug connections, we have indicating units compatible in terms of installation and function available at any time.

Safety technology

DEUTA indicating units offer SIL 2-capable solutions. That is what makes DEUTA the leader in safety technology for indicating units.

Longevity

High-quality components and processes lead to high MTBF values and low life-cycle costs.

Obsolescence management

Follow-up concepts are already considered during the design phase. This ensures the availability of the indicating units across the entire life cycle. New indicating units are compatible to the predecessors in form, fitting accuracy and function.

»DEUTA analogue panel meters -

ENG indicating units - a round affair for more safety!«

- Controlled either with voltage, currents or PWM signal
- Device versions available either with LED lighting or lamp bulb

Flexible control

The round indicating units **ENG 6** to **ENG 13** can be controlled either with voltages (AC, DC), currents (DC) or a PWM signal. Devices with current input can also be controlled with 4-20 mA.

Glowing example

All ENG devices, besides the versions with LED lighting, are also available the lamp bulb versions. These are called, e.g., "**ENG 13/8**".

Choice

Indicating units with 4...20 mA current input each have a "mechanical" and an "electrical" zero point (life zero). They are available either with flat connectors or D-Sub.

ENG 6

ENG 8/8, ENG 8/9

ENG 10/8, ENG 10/9

ENG 13/8, ENG 13/9

Feature/Specification	ENG 6 ENG 8/9 ENG 10/9 ENG13/9
Panel cutout	**ENG 6:** Ø $61^{+0.5}$ mm **ENG 8/9** Ø $81^{+0.5}$ mm **ENG 10/9:** Ø $101^{+0.5}$ mm **ENG 13/9:** Ø $131^{+0.5}$ mm
Installation depth	**ENG 6:** approx. 80 mm **ENG 8/9** approx. 90 mm **ENG 10/9:** approx. 90 mm **ENG 13/9:** approx. 90 mm
Weight	**ENG 6:** approx. 0.3 kg **ENG 8/9:** approx. 0.5 kg **ENG 10/9:** approx. 0.6 kg **ENG 13/9:** approx. 0.8 kg
Mounting	Clamping yoke / clamp
Installation position	0-90-180°
Degree of protection front face	IP53
Degree of protection plug	IP40
Connection	6.3 x 0.8 DIN 46244 / D-Sub
Internal scale illumination	**ENG 6, ENG.../8:** 1 x 2 W Ba7s **ENG 8/9, ENG 10/9, ENG13/9:** LED
External scale illumination	For devices without internal lighting possible via light slits
Input signals	AC, DC, PWM
Data for moving coil device	e.g. 20 mA, 1.5 mA[1)]
Load resistance	< 20 ohm at 20 mA meas.res.
Pointer deflection	240°
Accuracy class	**ENG 6:** 1.5 **ENG 8/9, ENG 10/9, ENG13/9:** 1.5; 1[2)]
Temperature range	-25°C to +70°C
Test voltage	1,000 V_{eff}, 50 Hz, 1 min
Vibration testing	EN61373 cat:1, class: B
Device definition	EN60051, EN50155
Conformity	CE
Housing	Sheet steel
Additional indicator	Individual versions with mileage recorder

[1)] others upon request
[2)] at extra charge

»DEUTA analogue panel meters -

EQG indicating units - square and good!«

- Controlled either with voltage, currents or PWM signal
- Device versions available either with LED lighting or lamp bulb

Durable

The EQG../9 indicating units have a square housing. They have the same features as the ENG series. A long-life LED lighting is integrated in the housings.

They are available in versions with flat connectors or with D-Sub.

EQG 9/9

EQG 14/9

Feature / Specification	EQG 9/9 EQG 14/9
Panel cutout	**EQG 9/9:** 92 x 92 $^{+0.8\,mm}$ **EQG 14/9:** 138 x 138 $^{+1\,mm}$
Installation depth	approx. 90 mm
Weight	**EQG 9/9:** approx. 0.6 kg **EQG 14/9:** approx. 0.8 kg
Mounting	Tensioning elements at the housing
Installation position	0- 90-180°
Degree of protection front face	IP53
Degree of protection plug	IP40
Connection	6.3 x 0.8 DIN 46244 / D-Sub
Internal scale illumination	with LED
External scale illumination	-
Input signals	AC, DC, PWM
Data for measuring device	e.g. 20 mA, 1.5 mA[1)]
Load resistance	< 20 ohm at 20 mA meas.res.
Pointer deflection	240°
Accuracy class	1.5
Temperature range	-25°C to +70°C
Test voltage	1,000 V_{eff}, 50 Hz, 1 min
Vibration testing	EN61373, cat: 1, class: B
Device definition	EN60051, EN50155
Conformity	CE
Housing	Aluminium

[1)] others upon request

»DEUTA analogue panel meters -

Double indicating units EGS -

independent indicating units for reference and actual values«

- Controlled either with voltage, currents or PWM signal
- Device versions available either with LED lighting or lamp bulb

Doubly safe

EGS 3/8 a indicating units have two independently operating moving coil instruments whose inputs can be adapted to current, voltage (AC/DC) or PWM signals.

Versions with current inputs of 4-20 mA make it easier to recognise malfunctions thanks to the mechanical and electrical zero point. The pointer will be below the zero position in case of errors in the current loop.

Choices

The indicating units **EGS 3/8 d** correspond in function to the EGS series. A 3-digit 7-segment display and an A/D converter are also installed. Control possible via current or voltage.

EGS 3/8 a

EGS 3/8 az

EGS 3/8 d

Feature / Specification	EGS 3/8 a	EGS 3/8 az	EGS 3/8 d
Panel cutout	Ø 131$^{+0.5}$ mm		
Installation depth	approx. 110 mm		
Weight	approx. 1 kg		
Mounting	Clamp		
Installation position	0-90-180°		
Degree of protection front	IP53		
Degree of protection plug	IP40		
Connection	6.3 x 0.8 DIN 46224		
Internal scale illumination	2 x 2W Ba7s		
External scale illumination	through light slits		
Input signal	AC, DC		
Data for measuring device	e.g. 20 mA, 1.5 mA[1)]		
Load resistance	< 20 ohm at 20 mA meas.res.		
Pointer deflection	240°		
Accuracy class	1.5, 1[2)]		
Temperature range	-25°C to +70°C		
Test voltage	1,000 V_{eff}, 50 Hz, 1 min		
Vibration testing	EN61373, cat: 1, class: B		
Device definition	EN60051, EN50155		
Conformity	CE		
Housing	Sheet steel		
Additional indicator		**EGS 3/8 az:** Counter 7-digit **EGS 3/8 d:** DVM 3-digit	
Supply		**EGS 3/8 az:** Counter 24 V DC ± 30 %, P = 250 mW **EGS 3/8 d:** 24 V DC ± 30 %	
Input signal		**EGS 3/8 az:** f_{max}12 Hz, pulse dur. min. 20ms **EGS 3/8 d:** 0-20 mA / voltage DC	

[1)] others upon request
[2)] at extra charge

»DEUTA analogue panel meters -

Double indicating units EGS -
independent indicating units for reference and actual values«

- Controlled either with voltage, currents or PWM signal
- Device versions available either with LED lighting or lamp bulb

Doubly safe

The indicating units have two independently operating moving coil instruments whose inputs can be adapted to current, voltage (AC/DC) or PWM signals.

Versions with current inputs of 4-20 mA make make it easier to recognise malfunctions thanks to the mechanical and electrical zero point. The pointer will be below the zero position in case of errors in the current loop.

Zero point at 12 o´clock pos.

The indicating units EGS 3/8 e are produced with the zero point at 12 o´clock position. The adjustment occurs to current or voltage.

Scale lighting

The **EGS 3/9** and **EGS 5/9** are also equipped with an internal LED scale lighting.

Additional indicators

The special feature of the **EGS 3/8 o** is the additionally installed 3-digit 7-segment display. The connection of every single segment, except for the last digit (fixed to zero) is run to the connecting plug. The device is controlled over external electronics.

EGS 3/8 e

EGS 3/8 o

EGS 5/8, EGS 5/9

Feature / Specification	EGS 3/8 e	EGS 3/8 o	EGS 5/8, EGS 5/9
Panel cutout	**EGS 3/8 e, EGS 3/8 o:** Ø $131^{+0.5}$ mm **EGS 5/8, EGS 5/9:** Ø $101^{+0.5}$ mm		
Installation depth	**EGS 3/8 e, EGS 3/8 o:** approx. 110 mm **EGS 5/8, EGS 5/9**: approx. 98 mm		
Weight	approx. 1 kg		
Mounting	Clamp		
Installation position	0-90-180°		
Degree of protection front	IP53		
Degree of protection plug	IP40		
Connection	**EGS 3/8 e:** 6.3 x 0.8 DIN 46224 **EGS 3/8 o:** D-Sub 37-pole **EGS 5/8, EGS 5/9**: 6.3 x 0.8 DIN 46244		
Internal scale illumination	**EGS 3/8 e:** 2 x 2W Ba7s **EGS 5/8:** 2 x 2W Ba7s **EGS 5/9**: with LED		
External scale illumination	through light slits		
Input signal	**EGS 3/8 e:** DC **EGS 3/8 o:** AC, DC **EGS 5/8, EGS 5/9**: AC, DC, PWM		
Data for moving coil device	**EGS 3/8 e:** -20-0-20 mA or -0, 75-0-0, 75 mA [1] **EGS 3/8 o:** 0-20 mA, 1.5 mA [1] **EGS 5/8, EGS 5/9**: 0-20 mA, 1.5 mA [1]		
Load resistance	< 20 ohm at 20 mA meas.res.		
Pointer deflection	**EGS 3/8 e:** 120° **EGS 3/8 o:** 240° **EGS 5/8, EGS 5/9**: 240°		
Accuracy class	**EGS 3/8 e:** 1.5 **EGS 3/8 o:** 1 **EGS 5/8, EGS 5/9**: 1.5, 1[2]		
Temperature range	-25°C to +70°C		
Test voltage	1,000 V_{eff}, 50 Hz, 1 min		
Vibration testing	EN61373, cat: 1, class: B		
Device definition	EN60051, EN50155		
Conformity	CE		
Housing	Sheet steel		
Additional indicator	**EGS 3/8 o:** 3-digit 7-segment display com. anode or cathode		

[1] others upon request
[2] at extra charge

»DEUTA analogue panel meters -

Double indicating unit EGS - doubly safe«

- Controlled either with voltage, currents or PWM signal
- Device versions available either with LED lighting or lamp bulb

Doubly safe

The indicating units have two independently operating moving coil instruments whose inputs can be adapted to current, voltage (AC/DC) or PWM signals.

Versions with current inputs of 4-20 mA make it easier to recognise malfunctions thanks to the mechanical and electrical zero point. The pointer will be below the zero position in case of errors in the current loop.

Scale lighting

The **EGS 10/9** is also equipped with an internal LED scale lighting.

Traction and voltage values

EGS 6 indicating units with a customer-specific RS485 - protocol and LED lighting.

The microcontroller is monitored with a reset module. The power is supplied through a galvanically isolated DC/DC converter.

EGS 9/8 bfa

EGS 10

EGS 6

Feature / Specification	EGS 9/8 bfa EGS 10/8 EGS 10/9 EGS 6
Panel cutout	**EGS 9/8 bfa:** Ø 138^{+1} x 138^{+1} mm **EGS 10/9:** Ø $92^{+0.8}$ x $92^{+0.8}$ mm **EGS 6:** Ø 185^{+1} x 92^{+1} mm
Installation depth	**EGS 9/8 bfa:** approx. 109 mm **EGS 10/9:** approx. 108 mm **EGS 6:** approx. 100 mm
Weight	**EGS 9/8 bfa, EGS 10/9:** approx. 1 kg **EGS 6:** approx. 0.8 kg
Mounting	**EGS 9/8 bfa:** Clamp **EGS 10/9:** Tensioning element at the housing **EGS 6:** V-clamp
Installation position	**EGS 9/8 bfa, EGS 10/9:** 0-90-180° **EGS 6:** 0-90-160°
Degree of protection front	**EGS 9/8 bfa:** IP50 **EGS 10/9, EGS 6:** IP 53
Degree of protection plug	IP40
Connection	**EGS 9/8 bfa, EGS 10/9:** 6.3 x 0.8 DIN 46224 **EGS 6:** Push-on terminal strip 10-pole, + D-Sub9
Internal scale illumination	**EGS 9/8 bfa:** with lamps **EGS 6, EGS 10/9:** with LED **EGS 10/8:** 2 x 2W Ba7s
Input signal	**EGS 9/8 bfa:** AC, DC **EGS 10/9:** AC, DC, PWM **EGS 6:** RS 485 - Telegram
Data for moving coil device	**EGS 9/8 bfa, EGS 10/9:** 0-20 mA, 1.5 mA [1] **EGS 6:** 1.5 mA
Load resistance	< 20 ohm at 20 mA meas.res.
Pointer deflection	240°
Accuracy class	**EGS 9/8 bfa:** 1.5; 1 **EGS 6, EGS 10/9:** 1.5
Temperature range	-25°C to +70°C
Test voltage	1,000 V_{eff}, 50 Hz, 1 min
Vibration testing	EN61373, cat: 1, class: B
Device definition	EN60051, EN50155
Conformity	CE
Housing	**EGS 9/8 bfa:** Sheet steel **EGS 10/9:** Aluminium **EGS 6:** Plastic, fibre reinforced

[1] others upon request

»DEUTA analogue panel meters -

ENGK indicating units - rugged and proven!«

- Rugged plastic housing
- Moving coil instrument with 240° pointer deflection

Particularly rugged

The indicating units **ENGK 6** to **ENGK 10** have a rugged plastic housing. Moving coil instruments with 240° pointer deflection are used for the ENGK devices. They can be controlled with AC or DC but also with PWM signals. The zero point of the scale is at bottom left

ENGK 6

ENGK 8

ENGK 10

Feature / Specification	ENGK 6	ENGK 8	ENGK 10
Panel cutout	**ENGK 6:** Ø 61$^{+0.5}$ mm **ENGK 8:** Ø 81$^{+0.5}$ mm **ENGK 10:** Ø 101$^{+0.5}$ mm		
Installation depth	approx. 85 mm		
Weight	**ENGK 6:** approx. 0.3 kg **ENGK 8:** approx. 0.35 kg **ENGK 10:** approx. 0.4 kg		
Mounting	Clamp		
Installation position	0-90-180°		
Degree of protection front face	IP66		
Degree of protection plug	IP20		
Connection	6.3 x 0.8 DIN 46244		
Internal scale illumination	1 x 2W Ba7s		
External scale illumination	through light slits		
Input signal	AC, DC		
Data for moving coil device	0-20 mA, 1.5 mA [1)]		
Load resistance	< 20 ohm at 20 mA meas.res.		
Pointer deflection	240°		
Accuracy class	1.5		
Temperature range	-25°C to +70°C		
Test voltage	1,000 V_{eff}, 50 Hz, 1 min		
Vibration testing	EN61373, cat: 1, class: B		
Device definition	EN60051, EN50155		
Conformity	CE		
Housing	Ultradur, UL Standard 94-V-0		

[1)] others upon request

»DEUTA digital indicating units -

for optimal readability«

- No moving parts (solid state technology), high degree of ruggedness
- Good fault detection, very good readability

BDA 4 - Compact digital indicating unit

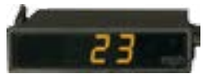
The speed indicating unit equipped with 5 bit Gray Code ensures increased safety in rail vehicles. It is suitable to indicate the speed as well as the driving stage.

DQA 9 - Digital single indicating unit

With a resolution of 1 mph/km/h the **DQA 9** offers optimal readability even from a greater distance. In addition to the integrated odometer indicator, the DQA 9 provides a 4...20 mA input for fault detection. The display can be controlled in two different brightness levels.

DQA 14 af - Digital double indicating unit

With a resolution of 128 LEDs the **DQA 14 af** offers optimal readability of the analogue display even from a greater distance. The 4...20 mA input provides fault detection. In addition to the two signal lamps for displaying operating states, the scale and the front are printed with long persistence after-glow. The brightness of the display can be varied in two stages.



BDA 4

DQA 9

DQA 14 af

Feature / Specification	BDA 4	DQA 9	DQA 14 af
Panel cutout	**BDA 4:** 92 x 22.2 mm **DQA 9:** 92 x 92 mm **DQA 14 af:** 138 x 138 mm		
Front dimensions	**BDA 4:** 96 x 24 mm **DQA 9:** 96 x 96 mm **DQA 14 af:** 144 x 144 mm		
Installation depth	**BDA 4:** approx. 175 mm **DQA 9:** approx. 109 mm **DQA 14 af:** approx. 102 mm		
Weight	**BDA 4:** approx. 0.5 kg **DQA 9, DQA 14 af:** approx. 1 kg		
Mounting	**BDA 4:** V-clamp **DQA 9, DQA 14 af:** Tensioning element		
Installation position	0-90-180°		
Degree of protection front	**BDA 4, DQA 9:** IP52 **DQA 14 af:** IP53		
Degree of protection plug	**BDA 4, DQA 9:** IP40 **DQA 14 af:** IP41		
Connection	**BDA 4:** Phoenix MC 1.5 **DQA 9:** Sub-D9 **DQA 14 af:** 2 x Sub-D 15		
Display	**BDA 4:** 7-segment LED, 2-digit **DQA 9:** 7-segment LED, 2-digit, 1.75' **DQA 14 af:** 7-segment LED, bar graph		
Input signal	**BDA 4:** 5 bit Gray code **DQA 9:** DC 4-20 mA **DQA 14 af:** DC 4-20 mA		
Load resistance	**DQA 9, DQA 14 af:** Ri - 200 Ω		
Scale angle	**DQA 14 af:** 320°		
Accuracy class	**DQA 9, DQA 14 af:** 1.0		
Operating temperature range	**BDA 4, DQA 9:** -25°C to +70°C **DQA 14 af:** -40°C to +70°C		
Test voltage	**BDA 4:** 500 V_{eff}, 50 Hz, 1 min **DQA 9, DQA 14 af:** 1000 V_{eff}, 50 Hz, 1 min		
Vibration testing	EN61373, cat: 1, class: B		
Conformity	CE		
Housing	**BDA 4:** Plastic **DQA 9, DQA 14 af:** Aluminium		
Additional indicator	**DQA 9:** Counter **DQA 14 af:** Signal lamp "Red" and "Yellow"		
Supply	**BDA 4, DQA 9:** 37.5 VDC **DQA 14 af:** 72 VDC		

»DEUTA indicating units with stepper motor -

ESG indicating units - for technically demanding usage conditions! «

- Modern ergonomic indicating configuration
- Continuous monitoring of pointer position through autonomous system
- Different types of measured variables can be displayed
- ESG 14 cy: two separate controllers for increased safety requirements (SIL 2)

Modern and secure

Pointers and scales are designed according to the most modern ergonomic aspects of design.

Monitoring function

The pointer position of the **ESG 3** can be transferred back as an 8 bit information to an upper level control unit.

The **ESG13/1 bqw** sends feedback as a 4...20 mA current signal.

Increased safety

The **ESG 14 cy** has a second separate controller as additional safety for the feedback. The ESG 14 cy is characterised by an integrated monitoring system (feedback unit) which always informs the user about the reliability of the speed information via monitoring by master computer.

ESG 3

ESG 13/1bqw

ESG 14 dybo

ESG 14 cy

Feature / Specification	ESG 3, ESG 13/1bqw, ESG 14 dybo, ESG 14 cy
Panel cutout	**ESG 3, ESG 13/1 bqw:** Ø 131$^{+0.5}$ mm **ESG 14 dybo, ESG 14 cy:** 138^{+1} x 138^{+1} mm
Installation depth	**ESG 3:** approx. 100 mm **ESG 13/1 bqw:** approx. 70 mm **ESG 14 dybo:** approx. 140 mm incl. connection **ESG 14 cy:** approx. 140 mm
Weight	**ESG 3:** approx. 0.65 kg **ESG 13/1 bqw:** approx. 0.35 kg **ESG 14 dybo, ESG 14 cy:** approx. 1 kg
Mounting	**ESG 3, ESG 13/1 bqw:** Clamp or assembly bracket **ESG 14 dybo, ESG 14 cy:** Tensioning element at the housing
Installation position	0-90-180°
Degree of protection front face	**ESG 3, ESG 13/1 bqw, ESG 14 dybo:** IP53 **ESG 14 cy:** IP54
Degree of protection plug	**ESG 3, ESG 13/1 bqw, ESG 14 dybo:** IP40 **ESG 14 cy:** IP41
Connection	**ESG 3:** 2 x D-Sub 37-pole **ESG 13/1 bqw:** 1 x D-Sub 37-pole **ESG 14 dybo:** 2 x D-Sub 15-pole 1 x Phoenix 10 -pole **ESG 14 cy:** 1 x D-Sub 15-pole/ 1 x D-Sub 24
External scale illumination	**ESG 3:** through light slits **ESG 13/1 bqw, ESG 14 dybo, ESG 14 cy:** with int. LED
Operating voltage	24V DC +/-30 % ; **ESG 14 dybo:** 36 V DC +/-30 %
Input signal	**ESG 3, ESG 13/1 bqw:** PWM, TTL **ESG14dybo**: 0...20 mA **ESG 14 cy:** RS 485 8 bit
Output	**ESG 3, ESG 13:** 8 bit binary **ESG 14 dybo:** 0..20 mA **ESG 14 cy:** RS 485
Error message	**ESG 3:** Open Collector, max. 30 V **ESG 13/1 bqw:** Relays and via LCD **ESG 14 dybo:** Open Collector, max. 30 V & signal lamp **ESG 14 cy:** via LCD
Pointer deflection	256° **ESG14cy**: 320°
Accuracy class	**ESG 3, ESG 13/1 bqw:** 0.6 % **ESG14dybo:** 1 % **ESG 14 cy:** 0.7 %
Adjustment speed	**ESG 3, ESG 13/1 bqw, ESG 14 dybo:** 60° <) second **ESG 14 cy:** 70° <) second
Temperature range	-25°C to +70°C
Test voltage	**ESG 3:** none **ESG 3/1 bqw, ESG14 cy**: 1000 V_{eff}, 50 Hz, 1 min **ESG 14 dybo**: 500 V_{eff}, 50 Hz, 1 min
Vibration testing	ENG61373, cat:1, class:B
Conformity	**ESG 3:** – **ESG 13/1 bqw, ESG 14 dybo:** CE **ESG 14 cy:** CE, SIL 2
Housing	**ESG 3, ESG 13/1 bqw:** Sheet steel **ESG 14 dybo, ESG 14 cy:** Aluminium, painted black
Additional indicator	**ESG 3:** 3-digit 7-segment display **ESG13/1bqw**: Error display **ESG 14 dybo:** 4 signal lamps / 1 brightness controller **ESG 14 cy:** 2 signal lamps, 1 LCD error display, expertise according to SIL 2

»DEUTA mechanical and electronic counters – proven and reliable!«

- For distance counting, as event counter, for quantity or length registration
- Stationary and mobile use
- Three counters with respectively individual start values
- Operating button and configuration software

ZE 15

The electronic counter **ZE 15** can be used as a distance or event counter and for counting quantity. It is equipped with three counters which can be incremented or decremented. A starting value can be individually assigned to every counter. One of the counters can be given a limit value which, once exceeded or dropped below, can activate an electrically isolated alarm output. With an operating button it is possible to determine the internal counter indicated on the display as well as the brightness level of the indicating unit.

The ZE 15 with the convenient configuration software offers diverse configuration and read-out possibilities of the counter module.

The maintenance free device has a non-volatile memory for storing the configuration and counter readings.

ZW 28/1

The odometer **ZW 28/1** records the distance in kilometres or miles at periodic examinations of the vehicle. The counter is attached to the axle bearing lid of rail vehicles with different drive options. ZW 28/1 odometer are purely mechanical counters and do not require auxiliary power.

ZE 15

Feature / Specification	ZE 15
Panel cutout	$69^{+0.5}$ x $38^{+0.5}$ mm (WxH)
Installation depth	approx. 75 mm incl. connecting plug
Display	8-digit, LED
Digit height	9 mm
Weight	0.2 kg (without plugs and mounting)
Mounting	Clamp
Degree of protection front	IP54
Degree of protection plug	IP20
Connection	Screw terminal
Operating voltage	24V DC ±30 %
Pulse voltage	10-30 V DC, 30-140 V DC
Max. input frequency	83 Hz
Min. pulse duration	6 ms
Reset	per software
Division ratio	variably configurable per software
Temperature range	-40°C to +70°C
Test voltage	1500 V_{eff}, 50 Hz, 1 min
Vibration testing	EN61373 cat:1, class:B
Device definition	EN60051, EN50155
Conformity	CE
Housing	Polystyrene
Fire protection	UL94-V0

ZW 28/1

Feature / Specification	ZW 28/1
Flange dimension	Flange dimensions 92 x 92 mm
Display	6-digit, number wheels
Digit height	5 mm
Weight	approx. 0.7 kg
Mounting	4 x M8
Degree of protection housing	IP65
Degree of protection drive	IP65 (drive)
Drive	Axle drive
Operating voltage	none required
Max. speed	2000 rpm^{-1}
Reset	sealable
Division ratio	195:1 to 11850:1
Temperature range	-25°C to +85°C
Housing	Cast aluminium

»DEUTA MFA -

modular driver's cab indicating unit!«

- Autonomous input and output device
- Up to 30 signal lamps can be realised in one MFA device

MFA 20 - Your access to the vehicle central devices

The indicating and input unit **MFA 20** is a central source of important information from the vehicle computer for the locomotive driver and the maintenance personnel.

The modular driver's cab indicating unit has a isolated power supply and communicates over an MVB interface. The indicating units are implemented as stepper motor indicating units, quasi analogue LED bar displays and seven-segment displays.

MFA 20 ba

Feature / Specification	MFA 20
Installation cut-out	360 x 205 mm (WxH)
Surface, colour	Membrane, according to choice
Installation depth	170 mm (without plug)
Weight	approx. 9 kg
Control V_actual	MVB
Feedback V_actual	MVB
Control V_target	MVB
Display V_actual, V_target	with pointer (ESG3)
Control V_target speed	MVB
Display V_target speed	3-digit 7-segment
Control distance from destination	MVB
Display distance from destination	Bar graph and 7-segment
Control train-braking force	MVB
Display train-braking force	with pointer (ESG3)
Control signal lamp	MVB and via plug connections
Version signal lamp	LED, 2 units each
Number of signal lamps	max. 30
Control elements	max. 8 buttons
Lighting	LED
Connection	different according to series[1)]
Power supply	24 VDC or 110 VDC
Power consumption	< 60 W
Temperature range	-20°C to 55°C
Test voltage	1000 V_{eff}, 50 Hz, 1 min [2)]
Vibration testing	EN 61373, cat: 1, class: B
Conformity	CE, DBAG, EBA

[1)] 2 x DIN 41612 design F
3 x D-Sub 9-pole
1 x D-Sub 15-pole
With MFA 20 for ICT, ICE 3,
ODU-MAC 169-pole

[2)] Only if secondary OV is not connected to the housing

»DEUTA competence –

tailor-made solutions and system safety!«

- Many years of DEUTA "know how" adapted to your application case
- System safety with SIL 2-capable DEUTA indicating units

»Transnationally deployable products,

with international competence!«

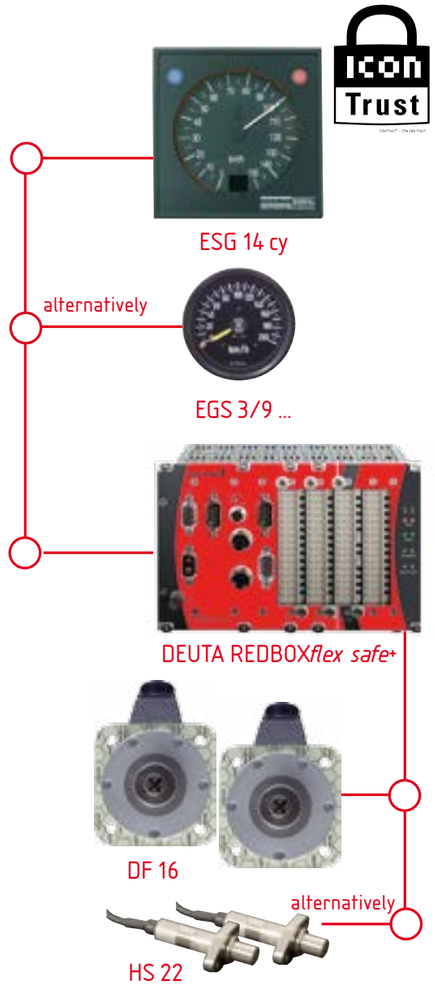
MFM 21 - An example for DEUTA Engineering Competence in the sector of transnational traffic

The modular driver's cab multi-system indicating unit MFM 21 is a device with signal lamps and key functions for train protection systems on rail vehicles of the Dutch and the Belgian state-owned railway.

The MFM 21 is an additional indicating and operating unit for the train interaction systems ATB and TBL.

»SIL 2 system safety with DEUTA indicating units –

assessed and certified!«



SIL 2-certified indicating units in functional safety systems

The DEUTA SIL indicating units offer additional safety. The ESG indicating units with stepper motor provide feedback over a separate controller. They are characterised by an integrated monitoring system in the form of a feedback unit.

The electrical EGS indicating units are equipped with two independently operating moving coil instruments whose input for Vactual is adapted to current signals.

Example for a DEUTA safety system:

- two indicating units: ESG 14 cy or alternatively EGS 3/9
- a multi-functional recorder DEUTA REDBOX*flex safe+*
- two axle-mounted generators DF 16, alternatively two Pick-up HS 22

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