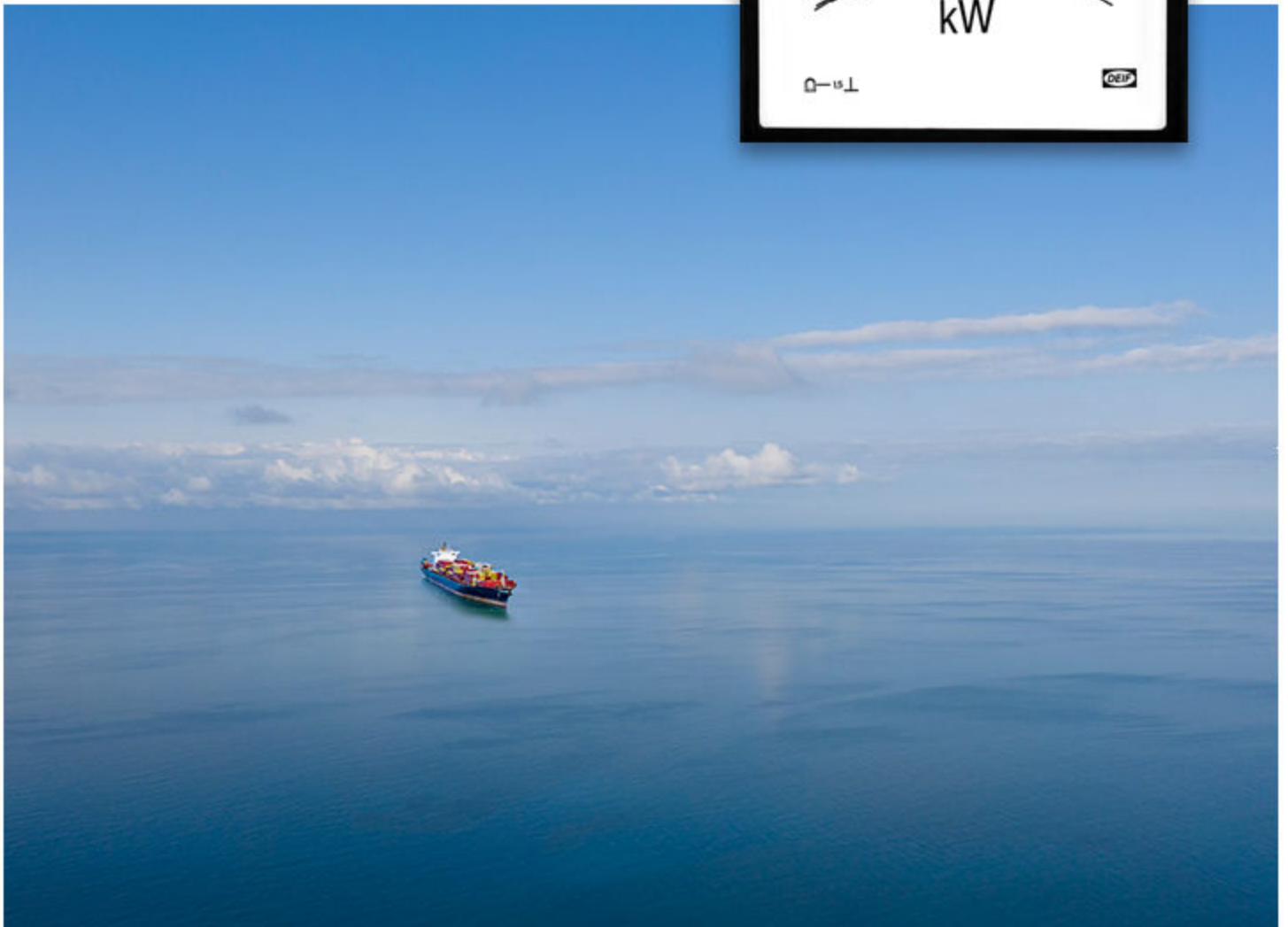
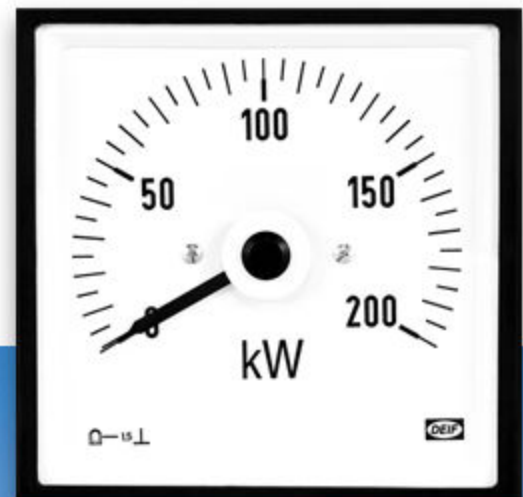


DQ and VDO

Voltmeters and ammeters, moving coil

Data sheet



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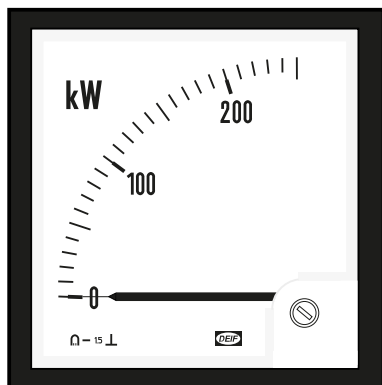
5. End-of-life

1. About DQ & VDQ

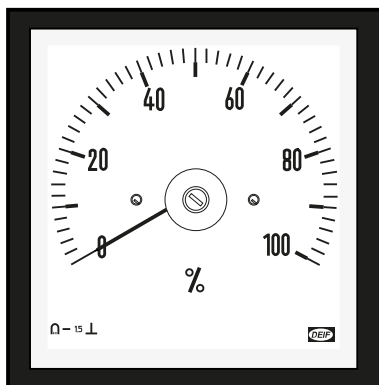
1.1 Application

The moving-coil instruments are designed for installation in panels of power distribution or applications where AC currents or voltages need to be measured.

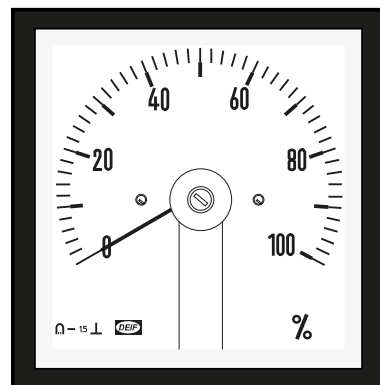
Use the DQ unit to measure low power DC signals. VDQ is a moving coil meter with a rectifier. You can use the VDQ to accurately measure RMS AC currents or voltages where a meter with low consumption is required.



DQ/VDQ96-x (changeable scale), 90°



DQ/VDQ96-c (fixed scale), 240°



DQ/VDQ96-xc (changeable scale), 240°

1.2 Variants

Moving coil	Q48 48 mm x 48 mm	Q72 72 mm x 72 mm	Q96 96 mm x 96 mm	Q144 144 mm x 144 mm
90°	DQ48-x	DQ72-x	DQ96-x	DQ144-x
240°	DQ48-c DQ48-xc	DQ72-c DQ72-xc	DQ96-c DQ96-xc	DQ144 DQ144-xc
with rectifier 90°		VDQ72-x	VDQ96-x	VDQ144-x
with rectifier 240°		VDQ72-c VDQ72-xc	VDQ96-c VDQ96-xc	VDQ144-c VDQ144-xc

1.2.1 Custom variants

Options

Anti-glare glass

IP54 (front of instrument and when installed with rubber gasket)

Adjustable red pointer (types Q48-x, Q72-x, Q96-x, Q144-x) (IP52)

NOTE Ask for availability of measuring ranges not stated in this data sheet.

Scale design

Optional graphics:

- Coloured lines (red, green, yellow)
- Coloured sections (red, yellow, green)
- Coloured figures (red, green, yellow)
- Application text (black, red, green, yellow)
- Single scale with double row of figures

- Double scale with two rows of figures
- Unit factor

New scale design

Measurement

Suppressed zero (DQ/VDQ..-x/DQ/VDQ..-c/-xc: max. 20 %)

Zero at centre of scale or similar

Integrated adjustment potentiometer (± 10 % standard, up to ± 50 % on request)

Adjusted to accuracy class 1.0 (not possible for type Q48)

2. Technical specifications

2.1 Electrical specifications

DQ specifications

Specifications	
Scale	Linear
Burden (voltmeter)	1 mA, R_i : 1 k Ω /V DC
Burden (ammeter)	60 mV DC to 0.6 V DC, 4 to 20 mA DC 1.6 V DC for -x and 1.80 V DC for -c at 20 mA DC (electrically suppressed)
Standard	DIN 43700

Type	Size (mm)	Measuring range V DC	Measuring ranges A DC	
DQ48-x	48 x 48	60 to 500 mV 1 to 300 V	1 mA to 600 mA	4 to 20 mA
DQ72-x	72 x 72	60 to 500 mV 1 to 300 V	1 mA to 600 mA, 5 to 7.5 A, 10 to 22 A, 25 to 37.5 A, and 40 to 50 A (*)	4 to 20 mA
DQ96-x	96 x 96	60 to 500 mV 1 to 300 V	200 μ A, 1 mA to 600 mA, 5 to 7.5 A, 10 to 22 A, 25 to 37.5 A, and 40 to 50 A (*)	4 to 20 mA
DQ144-x	144 x 144	60 to 500 mV 1 to 300 V	1 mA to 600 mA, 5 to 7.5 A, 10 to 22 A, 25 to 37.5 A, and 40 to 50 A (*)	4 to 20 mA
DQ48-xc/DQ48-c	48 x 48	60 to 500 mV 1 to 300 V	1 mA to 600 mA	4 to 20 mA
DQ72-xc/DQ72-c	72 x 72	60 to 500 mV 1 to 300 V	1 mA to 600 mA, 5 to 7.5 A, 10 to 22 A, 25 to 37.5 A, and 40 to 50 A (*)	4 to 20 mA
DQ96-xc/DQ96-c	96 x 96	60 to 500 mV 1 to 300 V	1 mA to 600 mA, 5 to 7.5 A, 10 to 22 A, 25 to 37.5 A, and 40 to 50 A (*)	4 to 20 mA
DQ144-xc/DQ144-c	144 x 144	60 to 500 mV 1 to 300 V	1 mA to 600 mA, 5 to 7.5 A, 10 to 22 A, 25 to 37.5 A, and 40 to 50 A (*)	4 to 20 mA

Measuring ranges (V DC and A DC)

- Standard measuring ranges: 1 - 1.2 - 1.5 - 2 - 2.5 - 3 - 4 - 5 - 6 - 8 and multiples of 10.
- Safety: Cat. III 300 V max. (515 V ph-ph (300 x $\sqrt{3}$))
- 4 to 20 mA: Electrically suppressed, voltage drop at 20 mA = 1.6 V for -x and 1.80 V for -c/-xc

NOTE (*) Higher measuring ranges. For use with standard shunt: 60 mV DC or 150 mV DC. Supplied with shunt lead, 2 x 1 m, 1 mm² (0.035 Ω)

VDQ specifications

Specifications	
Scale	Non-linear
Voltmeter	25 to 300 V AC (*)
Internal resistance	R_i : approximately 1 k Ω /V AC
Ammeter	1 to 600 mA AC
Burden	Voltage drop: approximately 1.2 V AC
Standard	DIN 43700

NOTE (*) Range < 50 V AC: max. 515 V derived from voltages with max. 300 V to earth (300 V cat. III/600 V cat. II).

General specifications

Specifications	
Accuracy	Class 1.5 (-10 to +15 °C to +30 to +55 °C) ± 1.5 % of full scale value (FS) To EN 60051
Bezels	Slim bezels To DIN 43718
Scale/pointer	Standard pointer To DIN 43802
Mounting angle	Standard Vertical (90° ±5°) Other angles - Horizontal mounting 60° to horizontal To DIN 16257
Measuring ranges	Others are available upon request. To DIN 43701

2.2 Environmental specifications

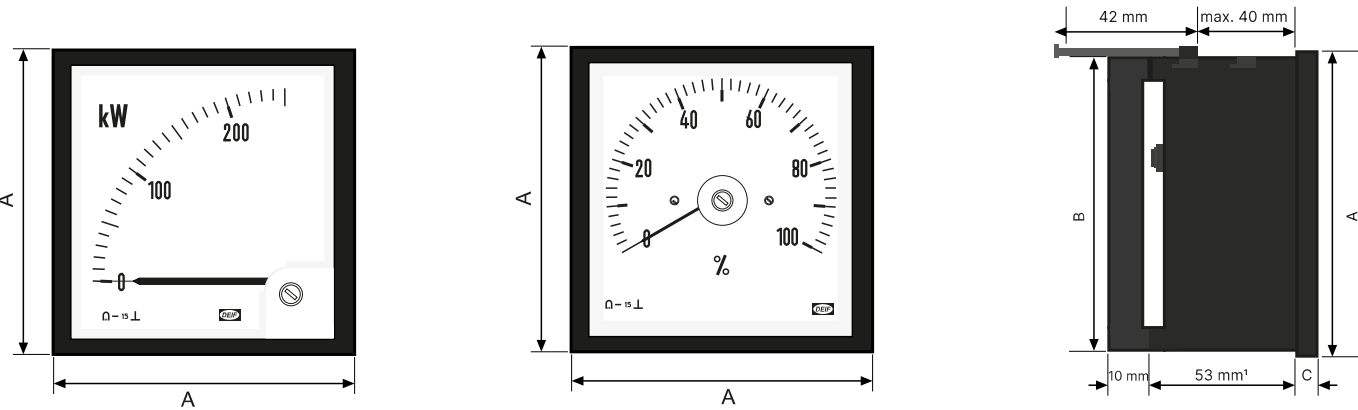
Conditions	
Nominal temperature *	-10 to +55 °C
Operating temperature *	-25 to +60 °C
Storage temperature *	-25 to +65 °C
Relative humidity	Class HUE, short-term condensing allowed Max. 95 % RH: max. 30 days per year Max. 85 % RH: remaining days Max. 75 % RH: average per year To DIN 40040
Panel influence *	The accuracy is not affected by the material or the thickness of the panel.
EMC	CE classified for residential, commercial, light industry, and industrial environments. To EN 61000-6-3/4 To EN 61000-6-1/2
Vibration	3 to 13.2 Hz: 3mm 13.2 to 100 Hz: 1 g GL and LR: Test 1 DNV: Class A
Shock	15 g, 6 times in 3 directions 50 g/6 ms 22 g/20 ms To IEC 68-2-27, Test: Ea
Safety	Pollution degree 2 Quadratic instruments are supplied with protective cover fitted over the terminals. To EN 61010-1
Materials	All plastic materials are self-extinguishing.

Conditions

	UL94 (V0)
Protections	Front IP52 (IP54 available **)
	Rear IP52
	Terminals (quadratic) IP20
	EN 60529

- NOTE** * To EN 60051
- NOTE** ** Marked on the label: IP54 for front of instrument only when rubber gasket is mounted.

2.3 Dimensions and weight



- NOTE** 1) For range 15 to 40 A, this length is 59 mm.
- NOTE** M4 screws are used in the DQ meter.

Dimensions

Type	Dimensions		
	A	B	C
Q48	48 mm	42.8 mm	5 mm
Q72	72 mm	66.5 mm	5.5 mm
Q96	96 mm	90 mm	5.5 mm
Q144	144 mm	136 mm	8 mm

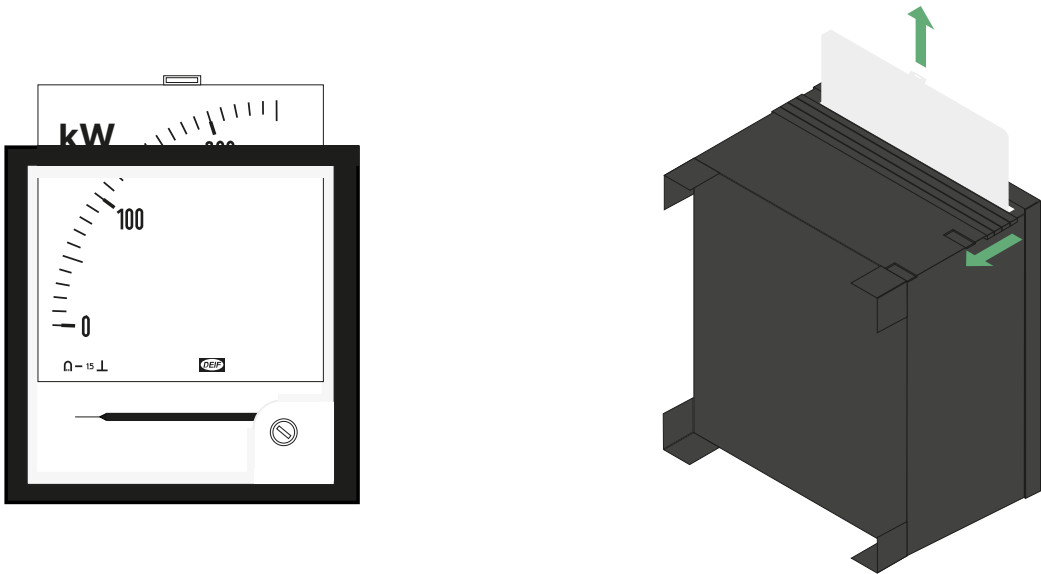
Panel cut-out

Type	Dimensions
Q48	45 mm x 45 mm + 0.3
Q72	68 mm x 68 mm + 0.4
Q96	92 mm x 92 mm + 0.4
Q144	138 mm x 138 mm + 0.5

Weight

Type	Weight
Q48-x	90 g
Q72-x	200 g
Q96-x	210 g
Q144-x	350 g
Q48-xc/c	180 g
Q72-xc/c	220 g
Q96-xc/c	250 g
Q144-xc/c	400 g

2.3.1 How to change the scale



NOTE Interrupt the signal before you remove the scale.

1. There is a moveable panel on top of the instrument behind the display. Pull this panel away from the front of the instrument to access the scale.
2. Use a suitable tool to remove the scale, for example, a screwdriver.
3. Insert a new scale into the open slot.
4. Push the panel back towards the front of the instrument until it clicks into place.

You do not need to calibrate the instrument after you have removed the scale.

3. Ordering

3.1 Available variants

Item no.	Variant no.	Variant description
2961010420	02	DQ48-x all measuring inputs, with standard scale
2961010420	04	DQ48-x with cos phi scale
2961060420	02	DQ48-c/-xc all measuring inputs, with standard scale
2961060420	03	DQ48-c/-xc with cos phi scale
2961010720	02	DQ/VDQ72-x all measuring inputs, with standard scale (except direct current >5 A DC)
2961010720	03	DQ/VDQ72-x direct current measurement with standard scale
2961010720	04	DQ/VDQ72-x with cos phi scale
2961060720	02	DQ/VDQ72-c/-xc all measuring inputs, with standard scale (except direct current >5 A DC)
2961060720	03	DQ/VDQ72-c/-xc direct current measurement with standard scale
2961060720	04	DQ/VDQ72-c/-xc with cos phi scale
2961010920	02	DQ/VDQ96-x all measuring inputs, with standard scale (except direct current >5 A DC)
2961010920	03	DQ/VDQ96-x direct current measurement with standard scale
2961010920	06	DQ/VDQ96-x with cos phi scale
2961060920	02	DQ/VDQ96-c/-xc all measuring inputs, with standard scale (except direct current >5 A DC)
2961060920	04	DQ/VDQ96-c/-xc direct current measurement with standard scale
2961060920	05	DQ/VDQ96-c/-xc with cos phi scale
2961011420	02	DQ/VDQ144-x all measuring inputs, with standard scale (except direct current >5 A DC)
2961061420	02	DQ/VDQ144-c/-xc all measuring inputs, with standard scale (except direct current >5 A DC)
2961061420	05	DQ/VDQ144-c/-xc direct current measurement with standard scale
2961061420	06	DQ/VDQ144-c/-xc with cos phi scale

3.2 Order specifications

Mandatory information					Additional options to the standard variant	
Item no.	Type	Variant no.	Measuring range	Scale	Option	Option

Ordering example

Mandatory information					Additional options to the standard variant	
Item no.	Type	Variant no.	Measuring range	Scale	Option	Option
2961060420-02	DQ48-c	02	0 to 10 V DC	0 to 100 %	Glass with red adjustable pointer	
2961010920-03	DQ/VDQ96-x	03	0 to 40 A	0 to 40 A	IP54	

4. Legal information

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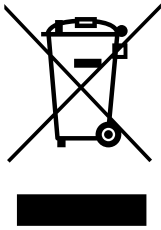
Copyright

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5. End-of-life

Disposal of waste electrical and electronic equipment

WEEE symbol



All products that are marked with the crossed-out wheeled bin (the WEEE symbol) are electrical and electronic equipment (EEE). EEE contains materials, components and substances that can be dangerous and harmful to people's health and to the environment. Waste electrical and electronic equipment (WEEE) must therefore be disposed of properly. In Europe, the disposal of WEEE is governed by the WEEE directive issued by the European Parliament. DEIF complies with this directive.

You must not dispose of WEEE as unsorted municipal waste. Instead, WEEE must be collected separately, to minimise the load on the environment, and to improve the opportunities to recycle, reuse and/or recover the WEEE. In Europe, local governments are responsible for facilities to receive WEEE. If you need more information on how to dispose of DEIF WEEE, please contact DEIF.