Pictograms of th <mark>e table head</mark>							
Un	Rated voltage (V)	In	Rated current (A)	Pmax	Max. power	Ps	Starting power
000	Solid, strained, fine wire	<u> </u>	Terminal capacity	LW	Dimensions (L \times W \times H)	m	Weight
0014 ELECTRO- MECHANICAL	Meter with electromechanical display	00878	Meter with LCD display	×digit	Display (number of digits)]] O bātt	Power supply
	Turns ratio	75mV	Shunt		Type of battery, sender	C I	Type of battery, receiver
0-	Width of rail (CT)	0-ø	Cable diameter (CT)	DIRECT→ kWh	Direct meter	CT ┇█[.→ kWh	Meter with current transformer
imp/kWh	Impulse output	Limp	Impulse width	→Iın	Starting current	lb (Imax)	Base current (max. current)
×⊠	Capacitor groups	*°F ় =====	Temperature measuring		Dim <mark>ensions of f</mark> rame	100 0-	Measuring range
0 10 	Accuracy class]ات ۲	Number of current transformers	L.	Cutting size (mm)		
		P	ictograms of t	he tech	nical data		
	Vibration resistance	th 50×ln	Rated thermal current	Fs 5	Security factor	-AUX	Auxiliary contacts
MKEH -MH	Certified current transformer	00 rel % 000000 00000 max. 95	Relativ humidity	Utest 1min 4 kV	Impulse voltage withstand	IP 52	Protection degree (installed, from the front side)
din 2,5×lth	Rated dynamic current	000000 ↓ 99999,9	Display of elapsed hour counter	.∵⇔.∷ L↓	Changeable scale	P m 4,5 VA	Self consumption
₩₩Ui 720 V	Rated insulation voltage		Continuous overload		Optical signal	imp out [mm ²] 1,5-2,5	Impulse output
	Cam switch		Momentary overload	_`20 ⁴⁰ _ 0 lin	Lineral scale		Not changeable scale
	Continuous overload	AC V test	AC voltage measuring	low batt ↓☆	Low battery display	+ VS-	Polarity display
(1s) In 4×In	Momentary overload	} test	Diode test	BATTERY test	Battery test	 	Logarithmic scale
AC A test	AC current measuring	230/400 V AC	Raged voltage (V)	hFE test	Measuring of amplification factor of transistor		Seal-leadable
DC V test	DC voltage measuring	Ta	Ambient temperature	35×7.5	Can be install on mounting rail	DC A test	DC current measuring
Ω test	Resistance measuring	[mm ²] 1-2,5	Connectable cable	Ts -30+65 °C	Storage temperature	°C/°F test	Temperature measuring
To	Operation temperature	P ■ 20	Protection of terminals (with protection cap)	ABS	Material: ABS	* ²	Laser class: 2
IP 20	Protection degree	G	Impulse generator	NCV	Voltage detection without contact	(L)>1/4 s	Laser radiation danger





Laser rangefinder





L

2

AC voltage meters









ΠA

DC voltage meters



Ν

V~

TRACON		0-20	ha %	1º
ACVM96-30	96 × 96 mm	0-30 V	1,5 %	90 mm
ACVM96-120	$96 \times 96 \text{ mm}$	0-120 V	1,5 %	90 mm
ACVM96-250	$96 \times 96 \text{ mm}$	0-250 V	1,5 %	90 mm
ACVM96-450	$96 \times 96 \text{ mm}$	0-500 V	1,5 %	90 mm
ACVM96-600	$96 \times 96 \text{ mm}$	0-600 V	1,5 %	90 mm
ACVM72-30	$72 \times 72 \text{ mm}$	0-30 V	1,5 %	66 mm
ACVM72-120	$72 \times 72 \text{ mm}$	0-120 V	1,5 %	66 mm
ACVM72-250	$72 \times 72 \text{ mm}$	0-250 V	1,5 %	66 mm
ACVM72-450	$72 \times 72 \text{ mm}$	0-500 V	1,5 %	66 mm
ACVM72-600	$72 \times 72 \text{ mm}$	0-600 V	1,5 %	66 mm
ACVM48-30	$48 \times 48 \text{ mm}$	0-30 V	1,5 %	42 mm
ACVM48-120	$48 \times 48 \text{ mm}$	0-120 V	1,5 %	42 mm
ACVM48-250	$48 \times 48 \text{ mm}$	0-250 V	1,5 %	42 mm
ACVM48-450	$48 \times 48 \text{ mm}$	0-500 V	1,5 %	42 mm
ACVM48-600	$48 \times 48 \text{ mm}$	0-600 V	1,5 %	42 mm

RELEVANT STANDARD	l
EN 60051	

RELEVANT STANDARD EN 61010

IP 52 (1h) 1,2×Un (1s) Un ∖ | V DC Ui Ui IP 00 Та `20⁴⁰ IP Un 20 660 V ABS -0 lin -25..+55°C 100 0 10 ••••••• ha % A TRACON 0-2 minin DCVM96-30 $96 \times 96 \text{ mm}$ 0-30 V 1,5 % 30 20 DCVM96-120 96 × 96 mm 0-120 V 1,5 % 96 × 96 mm 0-250 V TRACON DCVM96-250 1,5 % 10 96 × 96 mm DCVM96-400 0-400 V 1,5 % 96 × 96 mm DCVM96-600 0-600 V 1,5 % DCVM96 015-上會 (6 $72 \times 72 \text{ mm}$ DCVM72-30 0-30 V 1,5 % DCVM72-120 $72 \times 72 \text{ mm}$ 0-120 V 1,5 % 72 × 72 mm DCVM72-250 0-250 V 1,5 % DCVM72-400 $72 \times 72 \text{ mm}$ 0-400 V 1,5 % **DCVM72-600** 72 × 72 mm 0-600 V 1,5 % V= DCVM48-30 48 × 48 mm 0-30 V 1,5 % DCVM48-120 48 × 48 mm 0-120 V 1,5 % 48 × 48 mm 0-250 V 1,5 % DCVM48-250 лų DCVM48-400 $48 \times 48 \text{ mm}$ 0-400 V 1,5 % DCVM48-600 $48 \times 48 \text{ mm}$ 0-600 V 1,5 %



RELEVANT	S T A N D A R D
EN 6	0051



4

90 mm

90 mm

90 mm

90 mm

90 mm

66 mm

66 mm

66 mm

66 mm

66 mm

42 mm

42 mm

42 mm

42 mm

42 mm

ΠA

۲



Direct AC current meters



TRACO			0 10 	Ą
ACAM96-5	96 × 96 mm	0-5 A	1,5 %	90 mm
ACAM96-10	$96 \times 96 \text{ mm}$	0-10 A	1,5 %	90 mm
ACAM96-30	$96 \times 96 \text{ mm}$	0-30 A	1,5 %	90 mm
ACAM96-50	$96 \times 96 \text{ mm}$	0-50 A	1,5 %	90 mm
ACAM96-75	$96 \times 96 \text{ mm}$	0-75 A	1,5 %	90 mm
ACAM96-105	96 × 96 mm	0-100 A	1,5 %	90 mm
ACAM72-5	$72 \times 72 \text{ mm}$	0-5 A	1,5 %	66 mm
ACAM72-10	$72 \times 72 \text{ mm}$	0-10 A	1,5 %	66 mm
ACAM72-30	$72 \times 72 \text{ mm}$	0-30 A	1,5 %	66 mm
ACAM72-50	$72 \times 72 \text{ mm}$	0-50 A	1,5 %	66 mm
ACAM72-75	$72 \times 72 \text{ mm}$	0-75 A	1,5 %	66 mm
ACAM48-5	48 × 48 mm	0-5 A	1,5 %	42 mm
	RELEVANT STANDARD EN 60051	RELE	vant standard EN 61010	





These meters are eligible to measure the TRMS of the alternate current in 0-100 A current range without any other accessories. The measuring unit is an iron pointer. On the logarithmic scale the maximal elongation means twice as much as the metering range.

Direct DC current meters



DC milliampere meters

TRACON		100 0	0 10 	L.
DCAM96-0,02	$96 \times 96 \text{ mm}$	0-20 mA	1,5 %	90 mm
DCAM72-0,02	$72 \times 72 \text{ mm}$	0-20 mA	1,5 %	66 mm
DCAM48-0,02	48 × 48 mm	0-20 mA	1,5 %	42 mm

DC ampere meters

TRACON		100 0-	0 10 	L.
DCAM96-5	$96 \times 96 \text{ mm}$	0-5 A	1,5 %	90 mm
DCAM96-20	$96 \times 96 \text{ mm}$	0-20 A	1,5 %	90 mm
DCAM72-5	$72 \times 72 \text{ mm}$	0-5 A	1,5 %	66 mm
DCAM72-20	$72 \times 72 \text{ mm}$	0-20 A	1,5 %	66 mm
DCAM48-5	$48 \times 48 \text{ mm}$	0-5 A	1,5 %	42 mm
DCAM48-20	48 × 48 mm	0-20 A	1,5 %	42 mm

RELEVANT STANDARD **EN 60051** RELEVANT STANDARD EN 61010

TRACON

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Indirect AC current meters with changeable dial plate

These meters are eligible to measure indirectly the current values of high current electric circuits. Suitable current transformers (CT) are used for extension of the measuring range. The basic instrument will be connected to the 5 A secondary circuit of the CT. Changeable dial plates with 0 ... X metering range can be ordered according to the table below.





(1) Basic AC instruments



TRACON



L/4

	ACAM72-5	
	ACAM48-5	
		Г
		. .
	A~	
L —	CT L	
N	N	

ACAM96-5

RELEVANT STAN EN 61010	D A R D
RELEVANT STAN EN 60051	D A R D
48 × 48 mm	0-5 A
72 × 72 mm	0-5 A
96 × 96 mm	0-5 A

4

0-2



R

90 mm

(2) Dial plates for ACAM... current meters

A 1100 1000 100 TRACON ELECTRIC 100 000 A CC	TRACON		0- <u></u>
	SCALE-AC96-X/5A	96 × 96 mm	0-X (A)
	SCALE-AC72-X/5A	72 × 72 mm	0-X (A)
	SCALE-AC48-X/5A	48 × 48 mm	0-X (A)

Please indicate the X value when ordering according to the desired measuring range.

(3) Harmonization table for current transformers and dial plates for indirect current metering

		0-X		0-X	n h	0-X		<u>, 100</u> <u>, (100</u> <u>0-X</u>
	30/5	0-30 A	120/5	0-120 A	400/5	0-400 A	1500/5	0-1500 A
1-52	40/5	0-40 A	125/5	0-125 A	500/5	0-500 A	2000/5	0-2000 A
	50/5	0-50 A	150/5	0-150 A	600/5	0-600 A	2500/5	0-2500 A
	60/5	0-60 A	200/5	0-200 A	750/5	0-750 A	3000/5	0-3000 A
	75/5	0-75 A	250/5	0-250 A	800/5	0-800 A	4000/5	0-4000 A
L ^{-P2} 1/26	80/5	0-80 A	300/5	0-300 A	1000/5	0-1000 A	5000/5	0-5000 A
	100/5	0-100 A						

Please remark the X value at ordering according to the wanted measuring range!



Indirect DC current meters with changeable dial plate

according to the following table.

current electric circuits. The extension of the metering range happens with shunt; the basic meter with 0 ... 75 mV voltage range has to be

These meters are eligible to measure indirectly the current values of high



2





6



(2) Dial plates for DC current metering

TRACON		
SCALE-DC96-X/75mV	96 × 96 mm	0-X (A)
SCALE-DC72-X/75mV	72 × 72 mm	0-X (A)
SCALE-DC48-X/75mV	48 × 48 mm	0-X (A)

Please remark the X value at ordering according to the wanted measuring range!

(3) Harmonization table for shunts and dial plates for indirect current metering

[75mV]	0-X	75mV	0-X	75mV	0-X	[75mV]	0-X
TSF-30	0-30 A	TSF-100	0-100 A	TSF-400	0-400 A	TSF-1000	0-1000 A
TSF-40	0-40 A	TSF-150	0-150 A	TSF-500	0-500 A	TSF-1500	0-1500 A
TSF-50	0-50 A	TSF-200	0-200 A	TSF-600	0-600 A	TSF-2000	0-2000 A
TSF-75	0-75 A	TSF-300	0-300 A	TSF-750	0-750 A	TSF-3000	0-3000 A



L/5

L/8

Please indicate the X value when ordering according to the desired measuring range.

3

Power meters

These power meters measure the active power of single or three phases loads. The metering range of the devices is determined according to the primary current (X) of the applied CT-s with 5 A secondary current. In panel meters of 96×96 mm frame size, the basic instrument and the plastic casing (box) of the measuring electronics are placed in the same unit, whereas with the meters of 72×72 mm frame size, the measuring electronics and the basic instrument are delivered separately and should be placed and wired separately in the control box as well. Dial plates can be done according to the table below.



(1) Power meters



TRACON			Un	In	0 10 	L.]E Σ	L1 L2 L3 PEN 3~
W96-400V/4	$96 \times 96 \text{ mm}$	0-100	400 V~	X/5 A	1,5 %	90 mm	× 3	L1, L2, L3, N
W72-400V/4	$72 \times 72 \text{ mm}$	0-100	400 V~	X/5 A	1,5 %	66 mm	× 3	L1, L2, L3, N

(2) Dial plates for power meters

kW	TRACON		100
15 20	L1, L2, L3, N		<u>o-Č</u>
5 TRACON*	SCALE-W96/4-P	96 × 96 mm	0-P (kW)
E-0	SCALE-W72/4-P	72 × 72 mm	0-P (kW)
Dis. 10			

Please always indicate the X and P data when ordering.

(3) Harmonization table for current transformers and dial plates for single or three phase power metering

	100 <u>0 č</u>		00- 0- 3~		100 0
30/5	24 kW	125/5	100 kW	750/5	600 kW
40/5	32 kW	150/5	120 kW	800/5	640 kW
50/5	40 kW	200/5	160 kW	1000/5	800 kW
60/5	48 kW	250/5	200 kW	1500/5	1200 kW
75/5	60 kW	300/5	240 kW	2000/5	1600 kW
80/5	64 kW	400/5	320 kW	2500/5	2000 kW
100/5	80 kW	500/5	400 kW	4000/5	3200 kW
120/5	96 kW	600/5	480 kW	5000/5	4000 kW



L/6



TRACON

ELECTRIC



Legend CT = current transformer

Frequency meters



TRACON			0 <u>10</u> 	L.
F96-220/50	$96 \times 96 \text{ mm}$	45-55 Hz (230 V)	1,5 %	90 mm
F48-220/50	$48 \times 48 \text{ mm}$	45-65 Hz (230 V)	2,5 %	42 mm

Used to measure the frequency of low voltage networks, in the $45 \dots 55$ Hz range. Voltage has to be connected to the terminals of the device; the instrument displays the value of the frequency by help of a transformer enclosed within the unit.





EN 60051





RELEVANT STANDARD EN 61010

Power factor (cos $\boldsymbol{\phi}$) meters



TRACON		100 0-	Un	In	0 <u>10</u> 	L.
CF96-0,5/1	$96 \times 96 \text{ mm}$	0,5 cap-1-0,5 ind	240 V~	X/5 A	1,5 %	90 mm
CF72-0,5/1	$72 \times 72 \text{ mm}$	0,5 cap-1-0,5 ind	240 V~	X/5 A	1,5 %	66 mm
CF96-0,5/3	$96 \times 96 \text{ mm}$	0,5 cap-1-0,5 ind	400 V~	X/5 A	2,5 %	90 mm
CF72-0,5/3	$72 \times 72 \text{ mm}$	0,5 cap-1-0,5 ind	400 V~	X/5 A	2,5 %	66 mm

max.5

43 5.5 65

These devices are measuring the power factor of single or three phases systems in 0,5 capacitive - 0,5 inductive range. If the current is higher than 5 A, a secondary current transformer of 5 A shall be used. According to capacitive or inductive load of the system, the pointer moves to the left (capacitive) or to the right (inductive) side on the symmetrical scale. The metering changer is installed in the housing.

Wiring diagram for one phase system





TRACON ELECTRIC®

Wiring diagram for three phases system



Art of load

Lead = capacitive,

Laq = inductive



Operating time counters



Shunts

TRACON		L (mm)	C (mm)	B (mm)	H (mm)	M (mm)	TRACON	100 0-	L (mm)	C (mm)	B (mm)	H (mm)	M (mm)
TSF-30	30A/75mV	120	102	25	15	-	TSF-400	400A/75mV	126	100	35	22	$\text{M10}\times\text{35}$
TSF-40	40A/75mV	120	102	25	15	-	TSF-500	500A/75mV	126	100	43	22	M10 imes 35
TSF-50	50A/75mV	120	102	25	15	-	TSF-600	600A/75mV	126	100	50	22	M10 imes 35
TSF-75	75A/75mV	110	86	23	10	M8 imes 35	TSF-750	750A/75mV	126	102	74	22	$\text{M10}\times\text{35}$
TSF-100	100A/75mV	106	86	23	10	M8 imes 35	TSF-1000	1000A/75mV	126	102	94	22	$\text{M12}\times 60$
TSF-150	150A/75mV	116	86	21	22	$M8 \times 35$	TSF-1500	1500A/75mV	200	164	90	96	$M12 \times 60$
TSF-200	200A/75mV	116	86	21	22	$M8 \times 35$	TSF-2000	2000A/75mV	194	160	90	96	$M12 \times 60$
TSF-300	300A/75mV	127	100	26	22	M10 × 35	TSF-3000	3000A/75mV	198	160	142	96	$M12 \times 60$

The voltage drop between the two connectors of the shunt - induced by the current, flowing through the shunt - is proportional to the resistance of the shunt. Therefore, the intensity of the current flowing through the circuit can be determined in function of the voltage measured between the end-points of the shunt with known resistance value. The diagram illustrates the process of voltage drop (Um) in the shunt (Rs), measured with the instrument (mV). The current intensity value can be read directly on the dial scale in Ampere units.

The voltage drop between the measuring points of the available direct current shunts (TSF) is limited to max. 75 mV. Therefore, the measuring range of the attached basic instruments are also limited to 75 mV.



BELECTRIC®

Measuring instruments to be installed on rails

Analogue voltage meters



Analogue ampere-meters for direct measurement



* The miliamper meters for direct current can be used to measure current values of electronic actuating and control circuits. For instrument, specific scales are also available after consulting our staff. In this way, the meter will be suitable to measure physical values after transforming it to electric values (e.g. temperature, rev).



Analogue ampere-meters for indirect measurement, DC







Analogue frequency meters



Power factor meters



Digital measuring instruments



Modular analogue power meters

These devices are metering the effective power of one or three phase systems. The metering range is determined by the primary voltage (X) of current transformers with 5 A secondary current. The actuating electronic is delivered independently from device and it have to be placed in the controlling box independently as well.

Scales can be ordered for the meters according to the attached table.









(1) Power meters





TRACON		Un	In	0 10]Ε Σ	3~
W45S-230/1	0-100	230 V~	X/5 A	1,5 %	×1	L1
W45S-400/4	0-100	400 V~	X/5 A	1,5 %	×3	L1, L2, L3, N

(2) Dial plates for power meters

т	RACON	100	0 10
L1	L1, L2, L3, N	0_2	ha %
SCALE-45 W/1-X	SCALE-45 W/4-X	0-P (kW)	1,5 %



Please always indicate the X and P data when ordering.

(3) Harmonization table for current transformers and dial plates for single or three phase power metering

	0	0		0 <u>0</u> 1~	0		0	0		0	<u>0-</u>
30/5	7,5 kW	15 kW	120/5	30 kW	60 kW	400/5	100 kW	200 kW	1500/5	375 kW	750 kW
40/5	10 kW	20 kW	125/5	31,25 kW	62,5 kW	500/5	125 kW	250 kW	2000/5	500 kW	1000 kW
50/5	12,5 kW	25 kW	150/5	37,5 kW	75 kW	600/5	150 kW	300 kW	2500/5	625 kW	1250 kW
60/5	15 kW	30 kW	200/5	50 kW	100 kW	750/5	187,5 kW	375 kW	3000/5	750 kW	1500 kW
75/5	18,75 kW	37,5 kW	250/5	62,5 kW	125 kW	800/5	200 kW	400 kW	4000/5	1000 kW	2000 kW
80/5	20 kW	40 kW	300/5	75 kW	150 kW	1000/5	250 kW	500 kW	5000/5	1250 kW	2500 kW







Our range of products is continuously and quickly expanding. Our catalogue shows our products as of January 2023. Check our website to stay up-to-date.

SCAN THE QR CODE!

- Check our new products
- Be updated







Direct digital ammeter

230 X AC ABS	•••••••Ui IP 40 660 V	IP 20	(0,8-1,2)×Un	► Ta	A AC		Pictograms	L/0
TRACON		×digit	100 0-	0 <u>10</u> 	Ą	C (mm)	D (mm)	m
ACAMD-96-50	96 × 96 mm	×3	0-50 A AC	±2%	91 mm	67	8	445 g
ACAMD-72-50	$72 \times 72 \text{ mm}$	×3	0-50 A AC	±2%	68 mm	70	6	245 g

RELEVANT STANDARD RELEVANT STANDARD FN 61010 This device is able to directly measure current up to 50 A without any extra accessories. The pluggable terminals for power supply and metering are on the back side of the device. The output for current metering is one low-current transformer with 50/5A ratio also located at the back side of the device; the phase wire has to pass trough the CT. The meters are operating fully automatically and a three digit display gives information from the measured value.



Digital ammeter with adjustable CT transfer ratio (with relay output)

230		- Ui	IP 40	PIP	80878		Ta	– +AUX		AAC
V AC	ABS	660 V		_⊵20	(0,8-1,2)×Un	√	-25+65°C	L 1×CO	1-2,5	

TRACON		×digit		0 10 	L.	C (mm)	D (mm)	m
ACAMD-96	96×96 mm	×4	0-9500 A AC	±1%	91 mm	67	8	305 g
ACAMD-72	72×72 mm	×4	0-9500 A AC	±1%	68 mm	70	6	250 g
ACAMD-P-96*	96×96 mm	×4	0-9500 A AC	±1%	91 mm	67	8	320 g
ACAMD-P-72*	72×72 mm	×4	0-9500 A AC	±1%	68 mm	70	6	265 g

* Programmable relay output



These meters are able to measure the effective value of alternate current, the CT-s transfer ratio is adjustable from 5/5 A to 10000/5 A. The device is programmable by front panel buttons. The microprocessor based programming enables the user to check the adjusted CT ratio, and define the critical current level for over-current alert via relay output. The ACAMD type meter is a version of ACAMD-P type without relay output.



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Digital voltmeter (with phase-selection)



TRACON		©⊡⊟⊐⊟ ×digit	Un		0 10 	L.	C (mm)	D (mm)	m
ACVMD-96-500	$96 \times 96 \text{ mm}$	×3	400 V~	0-500 V AC	±1%	91 mm	67	8	300 g
ACVMD-72-500	$72 \times 72 \text{ mm}$	×3	400 V~	0-500 V AC	±1%	68 mm	70	6	240 g
ACVMD-K-96-500*	$96 \times 96 \text{ mm}$	×3	400 V~	0-500 V AC	±1%	91 mm	67	8	305 g
ACVMD-K-72-500*	$72 \times 72 \text{ mm}$	×3	400 V~	0-500 V AC	±1%	68 mm	70	6	245 g

* The needed phase can be selected with a pushbutton on the device's front panel.

The ACVMD type instrument can measure the effective voltage value of three phases systems between 0 and 500 V. The connection terminals for the measured system and the power supply can be found in the back of the device. While measuring line voltage the measured phases have to be connected to the V1 and V2 terminals.

In case of phase voltage measuring the phase and neutral wires have to be connected to the V1 and V2 terminals.

At ACVMD-K type the measures phases have to be connected to L1, L2 and L3 terminals.











Digital ammeter and voltmeter with adjustable CT ratio

230 V AC	ABS		IP 40	■ IP ■ 20	0.8-1,2)×Un		Ta	[mm²]	A AC	V AC
-------------	-----	--	-------	--------------	-------------	--	----	-------	------	------

TRACON		×digit	100 0-		0 <u>10</u> •••• ha %	L.	C (mm)	D (mm)	m
DTT-1-96	96×96 mm	×3/4	0-500 V AC	0-9500 A AC	±1%	91 mm	67	8	325 g
DTT-1-72	72×72 mm	×3/4	0-500 V AC	0-9500 A AC	±1%	68 mm	70	6	245 g

This microcontroller based device measures the connected line's current and voltage values. The current transformer (CT) ratio is adjustable from 5/5 A to 9500/5 A. The device measures the true effective (TRMS) values; the CT ratio is adjustable by front panel pushbuttons.

The pluggable terminals for power supply and metering are on the back side of the device. The voltage value is readable from the 3-digit display and the current value from the 4-digit LED one.







TRACON

ELECTRIC®

D



inter

MEASURING INSTRUMENTS

Digital frequency meter

230 V AC ABS	660 V	■ IP ■ 20	(0,8-1,2)×Un	» Ta	1-2,5			
TRACON		×digit		0 10 	L.F.	C (mm)	D (mm)	m
FD-96	$96 \times 96 \text{ mm}$	×3	45-75 Hz	±1%	91 mm	67	8	445 g
FD-72	$72 \times 72 \text{ mm}$	×3	45-75 Hz	±1%	68 mm	70	6	245 g

This sensitive and accurate micro metering the electric line's frequen 3 digits LED display. The pluggable device.

This sensitive and accurate microprocessor controlled meter is designed for metering the electric line's frequency. The measured value is readable from a 3 digits LED display. The pluggable terminals for power are on the back side of device.

D

e









Digital power factor meter

230 V AC ABS	660 V □	IP 20	(0,8-1,2)×Un	► Ta -25+65°C	[mm²] COSφ 1-2,5			
TRACON		×digit	100 0	0 <u>10</u> 	1.	C (mm)	D (mm)	m
CFD-96	96×96 mm	×3	0,1-0,99	±1%	91 mm	67	8	305 g

±1%

0,1-0,99



72×72 mm



L/14

CFD-72



×3



TRACON ELECTRIC®



70

This is a smart microprocessor-controlled instrument used for measuring power factors in single- and three-phase lines. The measured value is readable from a

3 digits LED display. The pluggable terminals for power are on the back side of device. Front panels LED-s are giving information about power factor's status.

68 mm

6



250 g

Digital multimeter

230 ABS	•••••Ui IP 4 660 V		IP 20 (0,8-1,2)×Un	Ta		[mm ²] VAC		Hz	
TRACON		ccene ×digit	100 0-2000 L-N	0 L-L	100 0	000 0	0 10 	Ţ,	m
DTT-2	96 × 96 mm	×4	0-300 V AC	0-500 V AC	0-9500 A AC	40-99,9 Hz	±1%	92 mm	470 g
DTT-3*	$96 \times 96 \text{ mm}$	×4	0-300 V AC	0-500 V AC	0-9500 A AC	40-99,9 Hz	±1%	92 mm	515 g

* Programmable relay output

This microcontroller based device was designed to measure the true effective value (TRMS) of current and voltage in all three phases and the frequency of the system. The multimeter is able to store minimum and maximum values for both current and voltage, and is also capable to show these values to the user when desired.

The DTT-3 type has also programmable features for under and over voltage limits, under and over current limits and delay time before producing contact output. The DTT-2 type is similar to the DTT-3 type but without relay output. The DTT-3 type has two different contact outputs for current and voltage fault. The connection for power supply and metering is available trough pluggable terminations on the back side of device.

The multimeter displays the momentary value of the current in all three phases and the frequency of the net. The line or phase voltage can be selected with the front panel pushbuttons and these momentary values are readable from the display. A LED lamp marks the selected phase. The current transformer (CT) ratio is also selectable with the front panel pushbuttons.







TRACON

ELECTRIC



EN 60051 RELEVANT STANDARD EN 61010



L/15

Digital panel meters

MEASURING INSTRUMENTS

DTT-5 detective multimeter





RELEVANT STANDARD

EN 60051

This device can measure current and voltage values and frequency of line on three phase systems. The detective multimeter was designed to sense, detect and inform impending mechanical and electrical failures in three phase motors. Modern detective multimeter technology with the capability of fault detection at early stage provides excellently reliable system monitoring advantages, a remarkable productivity of guality production, minimized maintenance and repair costs and extended life of machinery and equipment in use. The measured min/max current values are saved in memory and can be displayed by request. Moreover the device features adjustable over/under current and voltage protection limits with adjustable time delay settings prior to producing contact output for alert. The multimeter compares the stored values with the momentary values and switches on the alarm levels gradually according to deviation. The alarm output is a potential free changeover relay contact output what can work by voltage or current failure. Programming of the relay output allows for definition of the alarm level at which the relay shall react in case of abnormal current or voltage. The connection for power supply and metering is available through pluggable terminations on the back side of device. The three digit LED displays are giving information from momentary metered values. A LED lamp signs the selected value. The current transformer (CT) ratio is also selectable with front panel pushbuttons.



Digital panel meters

Power analyzer



This device is ideal for measuring, monitoring and controling the network's electric parameters.

Furthermore, current, phase and line voltage frequency, power factor, real, apparent, reactive power and energy are measurable with the device which is also able to meter both current and voltage harmonics of network. The four LED displays show the needed values from 75 measurable parameters. The device meters the real effective values (TRMS), and has two potential free, independent programmable relay outputs, that change state by alarm according to user adjusted limits. A LED indicator marks the selected ones. The connection for power supply and metering is available trough pluggable terminations on the back side of device. The current transformer (CT) ratio, the programming and the displayable value are all selectable with front panel push-buttons.

The operation of the device is fully automatic; its application is an advantage in all places where the energy supply control of the quality is important next to metering of the electric values.





RELEVANT STANDARD EN 60051





RELEVANT STANDARD EN 61010

.8



Remark	Measured value	Alarm	All	L1	L2	L3
VLN	Phase voltage (V)	~	✓ (*)	√	√	~
VLL	Line voltage (V)	~	✓ (*)	✓	√	✓
I	Phase current (A)	✓	✓	\checkmark	√	\checkmark
FRQ	Frequency (Hz)	-	-	~	-	-
PF	Power factor (cos φ)	-	✓ (*)	\checkmark	\checkmark	\checkmark
kW	Real power (kW)	~	✓	✓	√	✓
kVAr	Reactive power (kVAr)	✓	✓	~	√	√
kVA	Apparent power (kVA)	✓	✓	~	√	~
kWh	Real energy (kWh)	-	✓	-	-	-
kVArh.IND	Inductive reactive energy (kVArh)	-	√	-	-	-
kVArh.CAP	Capacitive reactive energy (kVArh)	-	✓	-	-	_
kVAh	Apparent energy (kVAh)	-	\checkmark	-	-	_
V _{THD}	Total harmonics distortion of voltage (%)	-	-	~	\checkmark	\checkmark
V ₃ V ₁₃	Voltage harmonics (THD; odd harmonics up to 13th)	-	-	√	√	√
I _{THD}	Total harmonics distortion of current (%)	-	-	√	\checkmark	\checkmark
3 13	Current harmonics (THD: odd harmonics up to 13 th)	_	_	\checkmark	√	\checkmark

* Device signs the mean value of metered values in three phases.





Direct energy meter



TR	ACON		Un	lb (Imax)		imp/kWh S0 _T_L	0 10 			m
TV0F11	DIRECT→ kWh		230 V AC	5 (40) A	20 mA – 40 A	2.000	1	10	6	84 g
TV0F12	DIRECT→ kWh		230 V AC	10 (60) A	40 mA – 60 A	500	1	25	16	157 g
TV0F14	DIRECT→ kWh		230 V AC	10 (100) A	40 mA – 100 A	1.600	1	50	35	236 g
TVOF1M4	DIRECT→ kWh	ELECTRO- MECHANICAL	230 V AC	10 (100) A	40 mA – 100 A	1.600	1	50	35	284 g
TV0F37	DIRECT→ kWh		3×230/400 V AC	10 (100) A	40 mA – 100 A	400	1	50	35	455 g
TV0F3M7	DIRECT→ kWh	0014 ELECTRO-	3×230/400 V AC	10 (100) A	40 mA – 100 A	400	1	50	35	472 g

















45



L/18

0

0

imp/kWh

S0___

0 0

I

1

45

⊐ mm²

10

<u>ہ</u>

260 q

kWh

<u>0 10</u>

ha %

1

16

Energy meters, 1 phase (1h)_{1,2×In} imp out - Ui Pm 0 00 % rH IP 40 PIP Ta Ts 1,5-2,5 Æ In e 20 660 V 1 VA 35×7.5 max. 95 -10..+50 °C -30..+65 °C imp/kWh lb 100 Un TRACON 0.0 (Imax) S0___ 00878 TVO-F1-CT CT CT → kWh 220-240 V AC 5A/CT 0,002lp-lp 6.400 LCD lp - primary current of current transformer

п CT – current transformer 73 75 49 CE O TRACON RELEVANT STANDARD INGLE PHASE EN 0 **IEC 61036** TVO-F1-CT RELEVANT STANDARD 87 EN 62053 N * 0 L Consuption - 1 Net ⊡⊕ Limp Un In SO T hŦ. Ν L.N - 27 5 min. 18 V, max. 27 V >30 ms max. 27 mA

Power meter, windows type, 1 phase

••••••••••••••••••••••••••••••••••••••		35×7.5 m	Ta ax. 95	Ts -30+65 °C	imp out kWh 1,5-2,5		
TRA			n (Ima	x) 0	imp/kWh 0 10 S0 1 ha %		m
TVO-F1-WT	DIRECT→ kWh	втв 220-240 СD 220-240	0 V AC 30 (100)) A 80 mA-100 A	800 1	25 16 20)0 g
			The wire mus window, after th contact with the The reduction of for the thinner w	t be put through the screw make the insulation cutting. ing has been include wires.	he he		
imp/kWh	Un	Limp	In	RELE	VANT STANDARD		
50 J L	min. 18 V, max. 27 V	>30 ms	max. 27 mA		IEG 01030		⇔
			TRA	CON		Ľ	19

ELECTRIC®

Energy meters, 3 phases



* per phase

lp – primary current of current transformer

CT – current transformer







IP 65

Phase corrector for three phase



The hi-tech microprocessor based correctors with LCD display are suitable for setting 6×3 capacitor groups. These correctors are metering the parameters in one phase and the interference happens accordingly.

The power ratio value and style and the switched levels are displayed in automatic mode. In manual mode, the phase's current and voltage, the voltage harmonics, the active- reactive and blind power of network can also be measured and displayed; the user can control the number of capacitor aroups too.

In automatic mode, the switching of capacitor groups takes place according to needed capacitor power and pre-adjusted parameters.

During rating process the switching of the levels follows a complex algorithm according to adjusted power factor value and level, protecting the capacitor groups and the switching contactors from run-down. The device has a potential free alarm output and it is programmable with its front panel pushbuttons.

Main functions

- 4 line LCD display, 20 digits / row
- Manual / automatic modes ٠
- Adjustable power ratio: cosφ 0,8 ind 0,8 cap
- Adjustable overheat protection •
- · Adjustable harmonic protection
- · Voltage and current measurement up to 21st harmonic
- · Alarms with alarm outputs
- Three phases, with phase control
- · Automatic load type identification
- · Delayed ON / OFF switching
- Adjustable overvoltage protection •
- Total harmonic display
- Voltage, current and power display •
- Password protection •

USB-485 converter for TFJA-08

■ IP ■ 00 ■ 00 ■ 00	$\begin{array}{c} & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ \\ \circ & \circ & \circ$		
TRACON	°℃*	m	
TFJA-08-RS485	-25 °C +99 °C	90 g	
		TR	





1/21

Correctors for one phase



Hi-Tech, microprocessor based correctors with LCD display. They are suitable for setting 7 or 12 capacitor groups. These correctors are metering the parameters in one phase and the interference happens accordingly.

The value and the style of power ratio, the phase current and voltage, the voltage harmonics, the capacitor's temperature and the number of switched capacitor groups are displayable. On manual state the user can control the number of capacitor groups. During testing process the connected levels and the level's reactive power ratio is defined automatically. In automatic mode, the switching of capacitor groups takes place according to needed capacitor power and pre-adjusted parameters.

During rating process the switching of the levels follows a complex algorithm according to adjusted power factor value and level, protecting the capacitor groups and the switching contactors from run-down. The device has a potential free alarm output and it is programmable with front panel pushbuttons. The cooling is getting active according to pre-adjusted and memory stored level when the capacitor's temperature is rising up. The alarm output's active state is displayed by front panel LED.

Main functions

- Adjustable power ratio (cos φ) between 0,8 ind. 1,0 cap;
- · Automatic and manual mode functions;
- · Exact initial capacitor power calculation;
- Automatic current limit adjustment (C/k value);
- Automatic polarity recognition on the CT terminals (k-I);
- · Adjustable overvoltage-overheat protection limit;
- · Alarm in case of over or under compensation;
- · Adjustable voltage-harmonics and overload protection limit;
- · Adjustable capacitor on and off switching time;
- Power factor, phase voltage and current, frequency, temperature, voltage harmonics range metering, control, display;
- · The art of failure and the switched number of levels also can be displayed.



L/22

Correctors for three phases



Hi-Tech, microprocessor based correctors with LCD display. They are suitable for setting 7 or 12 capacitor groups. These correctors are metering the parameters in all three phase and the interference happens accordingly.

The metering of values is on analyzer level, the different levels capacitor power can be adjusted independent. In manual mode the user can control the number of capacitor groups. In automatic mode, the switching of capacitor groups takes place according to needed capacitor power and pre-adjusted parameters.

During rating process the switching of the levels follows a complex algorithm according to adjusted power factor value and level, protecting the capacitor groups and the switching contactors from run-down. The device has a potential free alarm output and it is programmable with front panel pushbuttons. The cooling is getting active according to pre-adjusted and memory stored level when the capacitor's temperature is rising up. The alarm output's active state is displayed by front panel LED.

ELECTRIC

Main functions

- Adjustable cos φ range between 0,8 ind. and 0,9 cap. values;
- Automatic / manual mode:
- Independent adjustable capacitor power limits; •
- Automatic current detection; •
- Adjustable over voltage and overheat limit: •
- · Adjustable high harmonic level;
- Adjustable capacitor switching delay;
- Adjustable total harmonic distortion voltage level (V_{THD}; V₃; V₅...V₁₃);
- Dimmable total harmonic distortion current level (I_{THD}; I₃; I₅...I₁₃);
- Capacitor test mode: •
- Real, inductive, capacitive energy metering; •

C/k adjustment:	automatic, manual
CT polarization:	automatic
A/D converter	10 bit
Sampling:	64 sample/period
Contact / alarm output:	250 V/5 A AC



- Voltage, current, cos ϕ , THD (total harmonic distortion) control on every phase;
- Capacitor power: temperature: frequency: total power factor control:
- Alarm in case of overvoltage, high temperature, high reactive and real • energy rate, high harmonic ratio, with delay.



Automatic or manual correctors



These devices are microprocessor based correctors with LCD display. They are suitable for setting 5 or 7 capacitor groups. These correctors are metering the parameters in one phase and the interference happens accordingly. The switching of capacitor groups is coordinated with the metered capacitor powers and the pre-adjusted full reactive power values. During rating process the switching of the levels follows a complex capacitor metering and power factor determine algorithm according to adjusted power factor value and level, protecting the capacitor groups and the switching contactors from run-down. The device has a potential free alarm output and it is programmable with front panel pushbuttons. The cooling is getting active according to pre-adjusted and memory stored level when the capacitor's temperature is rising up. The alarm output's active state is displayed by front panel LED.

Main functions

- Adjustable power ratio ($\cos \varphi$) from 0,8 to 1;
- Automatic and manual mode;
- · Capacitor power metering;
- Automatic Ck adjustment;
- · Automatic current flow definition;
- · Dimmable capacitor on/off time;
- · Display of phase voltage and power factor values;
- In case of alarming the displaying happens with LED.













Automatic operated correctors



The TFJA-07 type reactive power corrector is fully automated and does not have any buttons on the front panel. The interference is happening according to the phase voltage and current in one phase. The device switches on the five capacitor groups in five steps by microcontroller based rating algorithm with contactors if the $\cos \phi$ value is less than 0,95, and switches off the capacitors, when the $\cos \phi$ value is more than 1. The switch on of capacitor groups happens in 14 seconds, the switch off happens with 5 seconds time delay. In load free or less load state, where $\cos \phi$ value is not between 0,95 and 1, the first capacitor level works as a joker capacitor; it switches on/off the capacitors according to defined delay time. The lowest capacitor groups has to be connected to the first level. During the rating process the switching of the levels happens by a complex algorithm. The form tanel LED-s give information from the number of switched levels and the power ratio's style. The capacitor group's power and the distributions for levels can be made by the next table.

Capacitor outputs	1 st level	2 st level	3 st level	4 st level	5 st level
Capacitor power	1 -1,5 kVAr	2,5 kVAr	5 kVAr	10 kVAr	20 kVAr

Input of voltage meter: Sampling: Input of current meter: Max. load of current input: Contact / alarm output: L1, N 64 sample/period k, I max. 7 A constant, 20 A / for 1 sec. 250 V/5 A AC

relevant standard **EN 60051**

RELEVANT STANDARD EN 61010



L1 C1 C2 C3 C4 C5





Low voltage current transformers

By using these devices, the measuring range of analogue or digital ammeters can be extended in the range of 5 - 3000 A. Similarly, the measuring range of the counters, power meters, multimeters, varmeters connected to the secondary contacts to the current transformers can also be extended.

Current transformers are made of a primary coil, a secondary coil and a ferromagnetic core. The primary coil is an actual coil built into the housing of the transformer or a cable or rail passing through the central hole of the transformer. In case of built-in primary coil or passed cable, the transformer has to be fixed by the kit delivered as accessory. In case of built in rail, the transformer shall be directly fastened to the rail.

The P1 end of the primary coil shall be connected to the network, the P2 end to the consumer. The S1 and S2 connectors shall be directly connected to the measuring instrument.



MEASURING INSTRUMENTS

AVBS (5/5A-150/5A)



AV30..SH (50/5A-200/5A)



TRACON

BELECTRIC

L/26

30 mm

40 mm

AV40..SH (100/5A-500/5A)

660 V AC	₩Ui 720 V		Utest Fs ^{1min} 3 kV 5	ity	$Ta I Ith 50 \times In Idin 2,5 \times Ith Idin 2,5 \times Ith Idin 2,5 \times Ith Idin Idin Idin Idin Idin Idin Idin Idin$
TRACON		Ps	0 10 • • 10 • • 10 • • 10 • • 10 • • • • •	m	
AV40100SH	100/5 A	2,5 VA	0,5	500 g	
AV40150SH	150/5 A	5 VA	0,5	500 g	
AV40200SH	200/5 A	5 VA	0,5	500 g	
AV40250SH	250/5 A	5 VA	0,5	500 g	
AV40300SH	300/5 A	5 VA	0,5	500 g	(4.)
AV40400SH	400/5 A	5 VA	0,5	500 g	P.C.
AV40500SH	500/5 A	5 VA	0,5	500 g	

AV100..SH (1200/5A-3000/5A)





ELECTRIC®

MEASURING INSTRUMENTS Portable metering devices **Digital multimeter** To I low batt ↓☆ 0-40 °C CAT G 200mA L/0 **Pictograms** Ш Ð \neg Hw 0 10 ha % 0 10 → 1 ha % 00 00878) ے m TRACON ×digit bätt V Ω A880L × 3.5 $\pm(2\%+10d)$ $\pm(3\%+5d)$ ±(2%+5d) 9V 6F22 $115 \times 65 \times 35$ mm 170 g Backlight TRACON A880L ii DC V 200 mV, 2 V, 20 V, 200 V, 500 V HOLD test CE 回 OFF AC V 200 V, 500 V test DC A 200 µA, 2 mA, 20 mA, 200 mA, 10 A test

Ω

test

test

G

RELEVANT STANDARD

EN 61010

200 Ω, 2 kΩ, 20 kΩ, 200 kΩ, 20 ΜΩ

3 V / 1 mA

3 V / 50 Hz / 560 kΩ

Digital multimeter

L/28

0

TRACON Φ </th
MM78C × 3.5 ±(1%+3d) ±(1.5%+5d) ±(0.8%+3d) 1,5V, 2×AA 188 × 89 × 52 mm 320 g Image: Second
TRACON MX780 DC V test 600mV/6V/60V/600V/1000V AC V test 6V/60V/600V/750V 0 DC A test 600uA/6000uA60mA/600mA/10A
AC V test 6V/60V/600V/750V DC A test 600uA/6000uA60mA/600mA/10A
DC A test 600uA/6000uA60mA/600mA/10A
AC A test 60mA/600mA/10A
Hz test 1Hz - 10MHz
F test 10pF - 60mF
TRUERMS CE ISA WARA #YE & COM ISA KARCON ISA KARCON
- 30 Ω



Digital multimeter

Portable metering devices

To I low batt ↓☆ 0-40 °C G NCV CAT 200mA 10A L/0 **Pictograms** Ш 0 10 ha % 000 L H W 00878 ے m TRACON batt ×digit V Ω HK36A × 3.5 $\pm (2\% + 10d)$ $\pm(3\%+5d)$ $\pm(1,5\%+2d)$ 9 V, 6F22 150×75×50 mm 270 g Backlight TRACON

DC V test	200 mV, 2 V, 20 V, 200 V, 500 V	
AC V test	200 V, 500 V	
DC A test	200 µA, 2 mA, 20 mA, 200 mA, 10 A	
Ω test	200 Ω, 2 kΩ, 20 kΩ, 200 kΩ, 20 MΩ	-
_ ₿_ test	2,5 V / 1 mA	
G	5 V / 50 Hz / 560 kΩ	EN 61010



Digital clamp meter

+ VS- \/ 	Ta low batt ↓☆ AC test	V DC V AC test te	CAΩ est test	— 以 — test	?	Pictograms	L/0
TRA	CON ×digit	0 10 	0 10 ha %	0 10 	0 bātt	LW	m
EM306B	× 3,5	$\pm(1,5\%+5d)$	\pm (2,5%+5d)	±(2,0%+5d)	1,5 V, 3×AAA	132×61×25 mm	170 g
DC V test		600 V					
AC V test		600 V					
AC A test	20) - 200 A				TRACON	
Ω test	200Ω - 2kΩ - 20kΩ	2 - 200kΩ - 2MΩ -	20MΩ			EM306B SELECT MENDI	
test	1,5	V; 0,6 mA					
Eurotion by	ttono			RELEVANT STA	A N D A R D O	COM A	vo#



Holding the momentary value





Portable metering devices

MEASURING INSTRUMENTS

Digital clamp meter



Transmitter

Wire Tra

The transmitter has five adaptors to connect to the wire

- RJ-11 connector
- Koax connector
- Double crocodile clip
- Automotive fuse connector

The adaptors can be found under the front plate.

TRACON

ELECTRIC

Receiver

To activate the receiver please push and hold the **TEST** button so the receiver senses the signal of transmitter. Move the device towards the wire to sense. If the wire is continuous a tone signal appears and the light of **LED** increases. The sensitivity of receiver can be adjusted with the **Sensitivity button**.



L/30

RELEVANT STANDARD

EN 61010

FIND OUR ROAD SAFETY SOLUTIONS!

Portable metering devices

L/31

Motor vehicle testing lamp

Ta 0+40 °C		Pictograms	L/0
TRACON	batt	L W	m
FV-06	-	118 × 11 × 11 mm	30 g
FV24	-	$3 \times 135 \text{ mm}$	45 g

DC V test

6-24 V

RELEVANT STANDARD EN 61010

Voltage tester screwdriver



Induction voltage tester



Laser rangefi	inder]		TRACON	TRACON
Та -10+50 °С		P 4					ار <u>، 659 م</u>	ة 1.863 m
TRACON		D	λ	⁺ v [−]	m	0 10 		
LDM40	<1 mW	0.1-40 m	620 - 690 nm	2×AAA 1,5V	70 g	1.5 mm		
LDM100	<1 mW	0.1-100 m	620 - 690 nm	2×AAA 1,5V	70 g	1.5 mm	Con con	Con con



Operation time: max. 10 sec



