

Control Components

Timers

Electromechanical



Type **KKH**

KOE

Characteristics	<ul style="list-style-type: none"> open, manual start timer manual time setting elapsed time indicator 	<ul style="list-style-type: none"> additional functions elapsed time indicator
Mounting	<ul style="list-style-type: none"> flush mounting front or side mounting 	<ul style="list-style-type: none"> surface mounting snap on or screws flush mounting with clip
Dimensions (mm)	55 x 73 x 65	surface: 45 x 70 x 99 flush: 45 x 45 x 93
Functions*	no	11, 12, 21, 22, 23 by external wiring
Time ranges	1, 5, 15, 30 min 1, 2, 3, 12, 24 h	6 time ranges, selected 0.1 s...60 h
Outputs	2 snap-action as change-over, 250 VAC, 16 A	1 timed and 1 instantaneous change-over contact, 250 VAC, 2/5 A
Supply voltage	230 VAC, 50 Hz	230 VAC, 50 Hz
Page	14	17

Timers

Electronic



Type **KOP.F**

KOL

KOP.J

KOP.K

Characteristics	<ul style="list-style-type: none"> large rotary dial DIN dimensions multifunction multi time range multi voltage 	<ul style="list-style-type: none"> 17.5 mm multifunction multi time range multi voltage 	<ul style="list-style-type: none"> 22.5 mm mono or multifunction high immunity to interference 	<ul style="list-style-type: none"> wide range of capabilities LED
Mounting	<ul style="list-style-type: none"> flush mounting plug-in on 11 pin socket 	<ul style="list-style-type: none"> surface mounting snap-on DIN rail 35 mm 	<ul style="list-style-type: none"> surface mounting snap-on DIN rail 35 mm 	<ul style="list-style-type: none"> surface mounting snap-on DIN rail 35 mm
Dimensions (mm)	45 x 45 x 95	17.5 x 80 x 70	22.5 x 75 x 109	22.5 x 75 x 109
Functions*	211, 212, 217, 221, 223, 247 by external wiring	11, 12, 21, 42, 51, 60	11, 12, 16, 19, 21, 22, 23, 24, 28, 31, 32, 33, 34, 41, 42, 51	11, 12, 16, 21, 22, 23, 24, 42, 19
Time ranges	12 time ranges, selected 0.01 s...10 h	6 time ranges, 0.05 s up to 10 h	12 time ranges, 0.05 s up to 60 h	10 time ranges, 0.05 s up to 60 h multi time 0.05 up to 60 h
Outputs	1 relay with two contacts as change-over, 250 VAC, 5 A	1 relay NO, KOL1.. 1 relay as change-over, KOL3.. 250 VAC, 5 A	1 relay as change-over, 250 VAC, 8 A	2 relays as change-over, instantaneous and/or timer, 250 VAC, 8 A
Supply voltage	24...230 VDC/VAC, 50/60 Hz	24...48 VDC or 24...240 VAC, 50/60 Hz	24...48 VDC or 24...240 VAC, 50/60 Hz	24...48 VDC or 24...240 VAC, 50/60 Hz
Page	20	24	28	32

* 11: delayed operation; 12: delayed release; 16: delayed operation and release; 21: fleeting-on delay timer; 22: fleeting-off delay timer; 23: impulse converter; 24: impulse generator; 42: flasher relay; 28: watchdog; 31/70: asymmetrical timer; 51: star-delta timer; 19: power off delayed release

Hour Meters

Electromechanical



Type	CMC	CMT	CMU
Characteristics	<ul style="list-style-type: none"> micro counter minimal power consumption 	<ul style="list-style-type: none"> DIN dimension 	<ul style="list-style-type: none"> cut-out 46 x 46 mm or \varnothing 50.5 mm
Mounting	<ul style="list-style-type: none"> flush mounting with clip 	<ul style="list-style-type: none"> flush mounting with clip or 2 screws M3 	<ul style="list-style-type: none"> flush mounting with clip
Dimensions (mm)	30 x 13 x 33	45 x 22 x 49	48 x 48
Counting capacity	99.999.99 h	DC: 999.999.99 h AC: 99.999.99 h	99.999.99 h
Display	<ul style="list-style-type: none"> mechanical, 4 mm high digit decimal places in red 	<ul style="list-style-type: none"> mechanical, 4 mm high digit decimal places in red 	<ul style="list-style-type: none"> mechanical, 4 mm high digit
Supply voltage	5 VDC and 12 VDC	12...24 VDC and 230 VAC	12...24 VDC 24 or 230 VAC 50 Hz
Page	38	42	44

Hour Meters

Electronic



Type	CXR	CXG 23, 28	CXE
Characteristics	<ul style="list-style-type: none"> large display standard DIN housing 	<ul style="list-style-type: none"> single, double or combined meter programmable 	<ul style="list-style-type: none"> LCD display preset value programmable resolution
Mounting	<ul style="list-style-type: none"> flush mounting with clip 	<ul style="list-style-type: none"> flush mounting with clip 	<ul style="list-style-type: none"> flush mounting with clip
Dimensions (mm)	90 x 42 x 105	45 x 22 x 59	45 x 45 x 86
Counting capacity	999.999, time units: h:min:s, s, 0.01 h or 0.01 s	999.999, time units: h:min:s or s:min:h	999.999, time units: h:min:s or s, min, h
Display	<ul style="list-style-type: none"> LED, 13 mm high digit 	<ul style="list-style-type: none"> LED, 8 mm high digit 	<ul style="list-style-type: none"> LCD, backlight 9 mm high digit – counting 8 mm high digit – preset
Supply voltage	11...30 VDC and 90...250 VAC	10...30 VDC	11...30 VDC and 90...250 VAC
Page	46	48	51

Counters

Electromechanical, Totalising



Type	CMB	CMA	CBG	CMM
Characteristics	<ul style="list-style-type: none"> micro size for PCB machine solder washable 	<ul style="list-style-type: none"> small size low current consumption 	<ul style="list-style-type: none"> robust totalising counter, proven over many years 	<ul style="list-style-type: none"> robust totalising counter with no, manual or electrical reset
Mounting	<ul style="list-style-type: none"> surface or PCB mounting flush mounting with clip snap-on DIN rail 35 mm 	<ul style="list-style-type: none"> surface mounting with nut flush mounting with clamping spring 	<ul style="list-style-type: none"> flush mounting with clamping spring 	<ul style="list-style-type: none"> surface mounting flush mounting with clamping spring
Dimensions (mm)	29 x 14 x 35 27 x 35 x 12 30 x 58 x 53	31 x 20 x 55 (50)	37 x 24 x 57	28 x 52 x 72
Counting capacity	9.999.999	999.999 without reset 99.999 with reset	9.999.999 without reset 99.999 with reset	99.999.999 without reset 999.999 with reset
Display	<ul style="list-style-type: none"> mechanical, 4 mm high digit optical 	<ul style="list-style-type: none"> mechanical, 4 mm high digit 	<ul style="list-style-type: none"> mechanical, 4 mm high digit 	<ul style="list-style-type: none"> mechanical, 4 mm high digit
Supply voltage	12 VDC, 24 VDC and 230 VAC	24 VDC and 230 VAC	6, 12, 24, 110, 220 VDC 24, 115, 230 VAC	12, 24 VDC and 24, 115, 230 VAC
Page	56	59	62	64

Counters

Electromechanical, Preset

Electronic, Totalising

Electronic, Differential



Type	CMM	CXB	CXG 20, 26	CXG 21
Characteristics	<ul style="list-style-type: none"> up counting, manual reset down counting, manual and electrical reset 	<ul style="list-style-type: none"> battery operated (lithium) 	<ul style="list-style-type: none"> single, double or combi counter programmable 	<ul style="list-style-type: none"> differential counter programmable
Mounting	<ul style="list-style-type: none"> flush mounting with clip 	<ul style="list-style-type: none"> flush mounting with clamping spring screw mounting on front 	<ul style="list-style-type: none"> flush mounting with clip 	<ul style="list-style-type: none"> flush mounting with clip
Dimensions (mm)	52 x 52 x 72	45 x 22 x 40	45 x 22 x 59	45 x 22 x 59
Counting capacity	99.999 CMM152 999.999 CMM362 CMM152 counting up with permanent display of the preset value CMM362 counting down	99.999.999	999.999	-199.999...999.999
Display	<ul style="list-style-type: none"> mechanical, 4 mm high digit 	<ul style="list-style-type: none"> LCD, 7 mm high digit 	<ul style="list-style-type: none"> LED, 8 mm high digit 	<ul style="list-style-type: none"> LED, 8 mm high digit
Supply voltage	24 VDC and 24, 115, 230 VAC	independent	10...30 VDC	10...30 VDC
Page	66	69	72	74

Counters

Electronic, Preset



Type **CXR**



Type **CXP**



Type **CXE**



Type **CXD**

Characteristics	<ul style="list-style-type: none"> ■ large display ■ standard DIN housing 	<ul style="list-style-type: none"> ■ 1 preset value ■ stationary display ■ battery operated (lithium) 	<ul style="list-style-type: none"> ■ 1 or 2 preset values or batch function ■ multifunction 	<ul style="list-style-type: none"> ■ counting up and down ■ reset to zero or preset value
Mounting	■ flush mounting with clip	■ flush mounting with clip	■ flush mounting with clip	■ flush mounting with clip
Dimensions (mm)	90 x 42 x 105	45 x 45 x 86	45 x 45 x 86	45 x 45 x 86
Counting capacity	999.999 h, min, s 0.01 h or 0.01 s	-19.999...99.999	-999.999...999.999	-19.999...99.999
Display	■ LED, 13 mm high digit	■ LCD, 7.5 mm high digit	■ LCD backlite, 9 mm high digit	■ 7-segment LED
Supply voltage	11...30 VDC and 90...250 VAC	independent	12.5...30 VDC, 230 VAC	24 VDC, 230 VAC
Page	77	80	82	85

Counters

Digital, Tachometers



Type **CXG 22, 25**



Type **CXD**



Type **CXE**

Characteristics	<ul style="list-style-type: none"> ■ CXG22: tachometer/frequency counter ■ CXG25: totalising counter and tachometer 	<ul style="list-style-type: none"> ■ monitors revolutions/velocity ■ flow rate control ■ 1 limit value 	<ul style="list-style-type: none"> ■ multifunction ■ 1 or 2 limit values
Mounting	■ flush mounting with clip	<ul style="list-style-type: none"> ■ surface mounting ■ flush mounting with clamping spring 	■ flush mounting with clip
Dimensions (mm)	45 x 22 x 59	45 x 45 x 86	45 x 45 x 86
Counting capacity	999.999 h, min, s 0.01 h or 0.01 s	0...99.999	999.999 h, min, s 0.01 h or 0.01 s
Display	■ LED, 8 mm high digit	■ LED, 7.5 mm high digit	■ LCD backlight, 9 mm high digit
Supply voltage	10...30 VDC	12.5...30 VDC and 230 VAC	11...30 VDC and 90...250 VAC
Page	88	91	94

Control Relays

Analog



Digital



Type	KFE 100/101/301	KFE 300	KFE 302	KFE 102/103
Characteristics	<ul style="list-style-type: none"> monitors over/under voltage mono fixed/adjustable mono/three phase: 5 or 10 min 	<ul style="list-style-type: none"> monitors loss of phase control, phase order, phase asymmetry and under voltage 	<ul style="list-style-type: none"> three phase surveillance of AC voltage 	<ul style="list-style-type: none"> KFE 102 measures voltage AC/DC KFE 103 measures current AC/DC
Mounting	<ul style="list-style-type: none"> snap-on DIN rail 35 mm 	<ul style="list-style-type: none"> snap-on DIN rail 35 mm 	<ul style="list-style-type: none"> snap-on DIN rail 35 mm 	<ul style="list-style-type: none"> snap-on DIN rail 35 mm
Dimensions (mm)	35 x 85 x 58	35 x 85 x 58	35 x 85 x 58	35 x 85 x 58
Setting	KFE 100: $U_{min} 0.75 U_N$; $U_{max} 1.2 U_N$ (fix) KFE 101/301: $U_{min} 0.8 U_N$; $U_{max} 1.2 U_N$	<ul style="list-style-type: none"> control asymmetry 5 to 20% under voltage phase order (fixed) loss of phase (fixed) 	<ul style="list-style-type: none"> $U_{min} 0.8 U_N$ $U_{max} 1.15 U_N$ (fix) memory option over voltage fix $1.15 U_N$ 	<ul style="list-style-type: none"> hysteresis 5 to 50% memory option KFE 102: $U_{min} 15 V$; $U_{max} 700 V_{DC}/480 V_{AC}$ KFE 103: $I_{min} 0.1 A$; $I_{max} 10 A$ AC/DC
Time range	<ul style="list-style-type: none"> 5 or 10 min, selection by wire bridge or switch 	<ul style="list-style-type: none"> 300 ms (fixed) 	<ul style="list-style-type: none"> 0.1 to 12 sec 	<ul style="list-style-type: none"> KFE 102: 0.1 to 12 sec KFE 103: 0.1 to 12 (20) sec
Outputs	1 relay (change-over contact); 8 A, 250 VAC	1 relay (change-over contact); 8 A, 250 VAC	1 relay (change-over contact); 8 A, 250 VAC	1 relay (change-over contact); 8 A, 250 VAC
Supply voltage	KFE 100/101: 230 VAC; 50/60 Hz; KFE 301: 400 VAC; 50/60 Hz; $P \leq 4 VA$	400 VAC; 50/60 Hz; $P \leq 4 VA$	400 VAC; 50/60 Hz; $P \leq 4 VA$	230 VAC; 50/60 Hz; $P \leq 4 VA$
Function control	<ul style="list-style-type: none"> fault and power supply LED 	<ul style="list-style-type: none"> phase fault, fault asymmetry and power supply LED 	<ul style="list-style-type: none"> fault and power supply LED 	<ul style="list-style-type: none"> display
Page	100	103	106	109

Control Relays

Thermistor



Type	KFT 100	KFT 200
Characteristics	<ul style="list-style-type: none"> temperature monitor PTC short circuit detection PTC broken wire detection reset by supply interruption 	<ul style="list-style-type: none"> temperature monitor memory function PTC short circuit detection PTC broken wire detection reset by supply interruption
Mounting	<ul style="list-style-type: none"> surface mounting snap on DIN rail 35 mm 	<ul style="list-style-type: none"> surface mounting snap on DIN rail 35 mm
Dimensions (mm)	22.5 x 75 x 96	22.5 x 75 x 96
Setting	automatic reset	manual or automatic reset
Outputs	1 relay (NO contact) 10 A, 250 VAC	1 relay (change-over contact) 10 A, 250 VAC
Supply voltage	230 VAC; 50/60 Hz; $P \leq 3 VA$	230 VAC; 50/60 Hz; $P \leq 3 VA$
Function control	red LED for fault green LED for power supply	red LED for fault green LED for power supply
Page	112	112

Counter

Energy Meter



Type	AAD1
Characteristics	<ul style="list-style-type: none"> single phase direct measurement class 1 precision PTB approval S0+/S0- output 1000 imp/kWh nominal current $I_N = 5 A$, $I_{max} 25 A$ according EN61036
Mounting	<ul style="list-style-type: none"> surface mounting snap on DIN rail 35 mm
Dimensions (mm)	17.5 x 85 x 59
Counting capacity	999.999.9
Display	<ul style="list-style-type: none"> mechanical, 4 mm high digit decimal places in red
Supply voltage	230 VAC, 50/60 Hz; $P \leq 8 VA$
Function control	flashing red LED
Page	118