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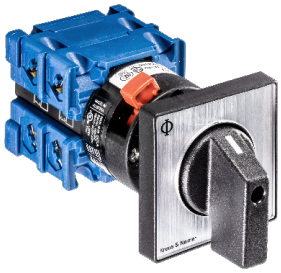

Sample image

Datasheet

Article number: 70010252
Designation: CH10.A220.FT2
Description: Switchgear

IEC 60947-3 EN 60947-3, VDE 0660 Teil 107

Rated insulation voltage Ui

Voltage (V)	AC / DC
690	AC / DC

Rated impulse withstand voltage Uimp

Voltage (kV)	Overvoltage category	Pollution degree	Supply system	Function
6	III	3	Valid for lines with grounded common neutral termination	switch
4	III	3	Valid for lines with grounded common neutral termination	Switch disconnector

Rated uninterrupted current Iu/Ith

Current (A)	Ambient temperature (°C)	Peak temperature (°C)	additional requirements
20	55	60	Ambient temperature +55°C during 24 hours with peaks up to +60°C

Conventional enclosed thermal current Ithe

Current (A)	Ambient temperature (°C)	Peak temperature (°C)	Additional requirements	No. of stages (from - to)	Mounting	Mounting size
20	35	40	Ambient temperature +35°C during 24 hours with peaks up to +40°C	--	--	--

Rated operational current Ie

Utilization category	Voltage (V)	Current (A)
AC-15	110 - 110	6
AC-15	220 - 240	6
AC-15	380 - 440	4
AC-20A	690	20
AC-21A	20 - 690	20
AC-22A	220 - 440	20
AC-22A	500 - 500	20
AC-22A	660 - 690	16

Rated operational power

Utilization category	Voltage (V)	No. of phases	No. of poles	Power (kW)
AC-2	220 - 240	3	3	4
AC-2	380 - 440	3	3	7,50
AC-2	500 - 500	3	3	10
AC-2	660 - 690	3	3	10
AC-3	220 - 240	3	3	3
AC-3	380 - 440	3	3	5,50
AC-3	500 - 500	3	3	5,50
AC-3	660 - 690	3	3	5,50
AC-3	110 - 120	1	2	0,60
AC-3	220 - 240	1	2	2,20
AC-3	380 - 440	1	2	3
AC-3	500 - 500	1	2	3
AC-3	660 - 690	1	2	3
AC-4	220 - 240	3	3	0,55
AC-4	380 - 440	3	3	1,50
AC-4	500 - 500	3	3	1,50
AC-4	660 - 690	3	3	1,50
AC-4	110 - 120	1	2	0,30
AC-4	220 - 240	1	2	0,75
AC-4	380 - 440	1	2	1,50
AC-23A	220 - 240	3	3	3,70
AC-23A	380 - 440	3	3	7,50
AC-23A	500 - 500	3	3	7,50
AC-23A	660 - 690	3	3	7,50
AC-23A	110 - 120	1	2	0,75
AC-23A	220 - 240	1	2	2,50
AC-23A	380 - 440	1	2	3,70
AC-23A	500 - 500	1	2	4
AC-23A	660 - 690	1	2	4

Max Fuse Rating IEC

Fuse characteristic	No. of Fuses	Current (A)
gG	1	25

Tested AC and DC values

Utilization category / Time constant	No. of contacts in series	Off or change-over switch	Voltage (V)	AC / DC	Current (A)
DC-13	1	ON - OFF	24	DC	3

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Tested AC and DC values					
Utilization category / Time constant	*No. of contacts in series*	*Off or change-over switch*	*Voltage (V)*	*AC / DC*	*Current (A)*
DC-13	1	ON - OFF	48	DC	1,70
DC-13	1	ON - OFF	60	DC	1,40
DC-13	1	ON - OFF	110	DC	0,70
DC-13	1	ON - OFF	220	DC	0,15
DC-13	2	ON - OFF	24	DC	6
DC-13	2	ON - OFF	48	DC	3
DC-13	2	ON - OFF	96	DC	1,70
DC-13	2	ON - OFF	120	DC	1,40
DC-13	2	ON - OFF	220	DC	0,70
DC-13	2	ON - OFF	440	DC	0,15
DC-21A	1	ON - OFF	24	DC	20
DC-21A	1	ON - OFF	48	DC	20
DC-21A	1	ON - OFF	60	DC	20
DC-21A	1	ON - OFF	110	DC	6
DC-21A	1	ON - OFF	220	DC	0,90
DC-21A	2	ON - OFF	48	DC	16
DC-21A	2	ON - OFF	96	DC	14
DC-21A	2	ON - OFF	120	DC	13
DC-21A	2	ON - OFF	220	DC	6
DC-21A	2	ON - OFF	440	DC	0,90
DC-21A	3	ON - OFF	72	DC	16
DC-21A	3	ON - OFF	144	DC	14
DC-21A	3	ON - OFF	180	DC	13
DC-21A	3	ON - OFF	330	DC	6
DC-21A	3	ON - OFF	660	DC	0,90
DC-21A	4	ON - OFF	96	DC	16
DC-21A	4	ON - OFF	192	DC	14
DC-21A	4	ON - OFF	240	DC	13
DC-21A	4	ON - OFF	440	DC	6
DC-21A	5	ON - OFF	120	DC	16
DC-21A	5	ON - OFF	240	DC	14
DC-21A	5	ON - OFF	300	DC	13
DC-21A	5	ON - OFF	550	DC	6
DC-21A	6	ON - OFF	144	DC	16
DC-21A	6	ON - OFF	288	DC	14
DC-21A	6	ON - OFF	360	DC	13
DC-21A	6	ON - OFF	660	DC	6
DC-21A	8	ON - OFF	192	DC	16
DC-21A	8	ON - OFF	384	DC	14
DC-21A	8	ON - OFF	480	DC	13
DC-22A	1	ON - OFF	24	DC	20
DC-22A	1	ON - OFF	48	DC	20
DC-22A	1	ON - OFF	60	DC	12
DC-22A	1	ON - OFF	110	DC	1,90
DC-22A	1	ON - OFF	220	DC	0,30
DC-22A	2	ON - OFF	48	DC	14
DC-22A	2	ON - OFF	96	DC	13
DC-22A	2	ON - OFF	120	DC	12
DC-22A	2	ON - OFF	220	DC	1,90
DC-22A	2	ON - OFF	440	DC	0,30
DC-22A	3	ON - OFF	72	DC	14
DC-22A	3	ON - OFF	144	DC	13
DC-22A	3	ON - OFF	180	DC	12
DC-22A	3	ON - OFF	330	DC	1,90
DC-22A	3	ON - OFF	660	DC	0,30
DC-22A	4	ON - OFF	96	DC	14
DC-22A	4	ON - OFF	192	DC	13
DC-22A	4	ON - OFF	240	DC	12
DC-22A	4	ON - OFF	440	DC	1,90
DC-22A	5	ON - OFF	120	DC	14
DC-22A	5	ON - OFF	240	DC	13
DC-22A	5	ON - OFF	300	DC	12
DC-22A	5	ON - OFF	550	DC	1,90
DC-22A	6	ON - OFF	144	DC	14
DC-22A	6	ON - OFF	288	DC	13
DC-22A	6	ON - OFF	360	DC	12
DC-22A	6	ON - OFF	660	DC	1,90
DC-22A	8	ON - OFF	192	DC	14
DC-22A	8	ON - OFF	384	DC	13
DC-22A	8	ON - OFF	480	DC	12
DC-23A	1	ON - OFF	24	DC	20
DC-23A	1	ON - OFF	48	DC	20
DC-23A	1	ON - OFF	60	DC	10
DC-23A	1	ON - OFF	110	DC	1,50
DC-23A	1	ON - OFF	220	DC	0,20
DC-23A	2	ON - OFF	48	DC	13

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Tested AC and DC values

Utilization category / Time constant	No. of contacts in series	Off or change-over switch	Voltage (V)	AC / DC	Current (A)
DC-23A	2	ON - OFF	96	DC	12
DC-23A	2	ON - OFF	120	DC	10
DC-23A	2	ON - OFF	220	DC	1,50
DC-23A	2	ON - OFF	440	DC	0,20
DC-23A	3	ON - OFF	72	DC	13
DC-23A	3	ON - OFF	144	DC	12
DC-23A	3	ON - OFF	180	DC	10
DC-23A	3	ON - OFF	330	DC	1,50
DC-23A	3	ON - OFF	660	DC	0,20
DC-23A	4	ON - OFF	96	DC	13
DC-23A	4	ON - OFF	192	DC	12
DC-23A	4	ON - OFF	240	DC	10
DC-23A	4	ON - OFF	440	DC	1,50
DC-23A	5	ON - OFF	120	DC	13
DC-23A	5	ON - OFF	240	DC	12
DC-23A	5	ON - OFF	300	DC	10
DC-23A	5	ON - OFF	550	DC	1,50
DC-23A	6	ON - OFF	144	DC	13
DC-23A	6	ON - OFF	288	DC	12
DC-23A	6	ON - OFF	360	DC	10
DC-23A	6	ON - OFF	660	DC	1,50
DC-23A	8	ON - OFF	192	DC	13
DC-23A	8	ON - OFF	384	DC	12
DC-23A	8	ON - OFF	480	DC	10

Rated conditional short-circuit current

Current (kA)	Text	cut-off current Ic (kA)	Durchlassenergie I²t (kA²s)
2	--	1,65	2,73

Rated short-circuit making capacity Icm

Current (A)
600

UL60947-4-1 , UL508

Nominal Voltage

Voltage (V)	AC / DC
600	AC

Rated insulation voltage Ui

Voltage (V)	AC / DC
600	AC

Rated thermal current

Current (A)	Ambient temperature (°C)	Additional Text
20	0 - 40	--

Horsepower rating

Across-the-Line Motor Starting	Voltage (V)	No. of phases	No. of poles	Power (HP)	Ambient temperature [°C]
DOL	110 - 120	1	2	0,50	40
DOL	220 - 240	1	2	1	40
DOL	277 - 277	1	2	2	40
DOL	440 - 480	1	2	2	40
DOL	550 - 600	1	2	2	40
DOL	110 - 120	3	3	1,50	40
DOL	220 - 240	3	3	3	40
DOL	440 - 480	3	3	5	40
DOL	550 - 600	3	3	5	40

Pilot duty rating code

Duty Code
A600

SCCR / Max. fuse rating

Conditions of acceptability

These devices are suitable for use on circuits capable of delivering not more than 5kA rms symmetrical amperes, 600V ac max. when protected by Class RK1 fuses.

Temp. rating of wire

Temperature rating (°C)	Current (A)	Text
60 - 75	--	Use copper wire only

General Use

AC / DC	Voltage (V)	Current (A)	No. of phases	No. of poles	No. of contacts in series
AC	277	20	1	1	1
AC	600	20	1	2	1
AC	600	20	3	3	1

CSA

Nominal Voltage

Voltage (V)	AC / DC
600	AC

Rated insulation voltage Ui

Voltage (V)	AC / DC
600	AC

Rated thermal current

Current (A)	Ambient temperature (°C)	Additional Text
20	0 - 40	--

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Horsepower rating

Across-the-Line Motor Starting	*Voltage (V)*	*No. of phases*	*No. of poles*	*Power (HP)*	*Ambient temperature [°C]*
DOL	110 - 120	1	2	0,50	40
DOL	220 - 240	1	2	1	40
DOL	277 - 277	1	2	2	40
DOL	440 - 480	1	2	2	40
DOL	550 - 600	1	2	2	40
DOL	110 - 120	3	3	1,50	40
DOL	220 - 240	3	3	3	40
DOL	440 - 480	3	3	5	40
DOL	550 - 600	3	3	5	40

Pilot duty rating code

Duty Code
A600

Temp. rating of wire

Temperature rating (°C)	*Current (A)*	*Text*
75	--	--

General Use

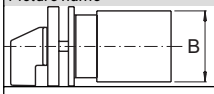
AC / DC	*Voltage (V)*	*Current (A)*	*No. of phases*	*No. of poles*	*No. of contacts in series*
AC	277	20	1	1	1
AC	600	20	1	2	1
AC	600	20	3	3	1

MASTER DATA

Max. number of stages

number of stages	*Modul*
12	FL

Switch Measures

Picture name	*B*	*F*	*H*	*H1*	*H2*	*H3*
	46	--	--	--	--	--

GENERAL TECHNICAL INFORMATION

Tested AC and DC values

Utilization category / Time constant	*No. of contacts in series*	*Off or change-over switch*	*Voltage (V)*	*AC / DC*	*Current (A)*
T≤1ms	1	ON - OFF	24	DC	20
T≤1ms	1	ON - OFF	48	DC	12
T≤1ms	1	ON - OFF	60	DC	4,50
T≤1ms	1	ON - OFF	110	DC	1
T≤1ms	1	ON - OFF	220	DC	0,40
T≤1ms	1	ON - OFF	440	DC	0,27
T≤1ms	2	ON - OFF	48	DC	20
T≤1ms	2	ON - OFF	95	DC	12
T≤1ms	2	ON - OFF	120	DC	4,50
T≤1ms	2	ON - OFF	220	DC	1
T≤1ms	2	ON - OFF	440	DC	0,40
T≤1ms	2	ON - OFF	660	DC	0,27
T≤1ms	3	ON - OFF	70	DC	20
T≤1ms	3	ON - OFF	140	DC	12
T≤1ms	3	ON - OFF	180	DC	4,50
T≤1ms	3	ON - OFF	330	DC	1
T≤1ms	3	ON - OFF	660	DC	0,40
T≤1ms	4	ON - OFF	95	DC	20
T≤1ms	4	ON - OFF	190	DC	12
T≤1ms	4	ON - OFF	240	DC	4,50
T≤1ms	4	ON - OFF	440	DC	1
T≤1ms	5	ON - OFF	120	DC	20
T≤1ms	5	ON - OFF	240	DC	12
T≤1ms	5	ON - OFF	300	DC	4,50
T≤1ms	5	ON - OFF	550	DC	1
T≤1ms	6	ON - OFF	145	DC	20
T≤1ms	6	ON - OFF	290	DC	12
T≤1ms	6	ON - OFF	360	DC	4,50
T≤1ms	6	ON - OFF	660	DC	1
T≤1ms	8	ON - OFF	190	DC	20
T≤1ms	8	ON - OFF	350	DC	12
T≤1ms	8	ON - OFF	450	DC	4,50
T=50ms	1	ON - OFF	24	DC	12
T=50ms	1	ON - OFF	30	DC	5
T=50ms	1	ON - OFF	48	DC	2
T=50ms	1	ON - OFF	60	DC	1
T=50ms	1	ON - OFF	110	DC	0,40
T=50ms	2	ON - OFF	48	DC	12
T=50ms	2	ON - OFF	60	DC	5
T=50ms	2	ON - OFF	95	DC	2
T=50ms	2	ON - OFF	120	DC	1
T=50ms	2	ON - OFF	220	DC	0,40
T=50ms	3	ON - OFF	70	DC	12

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Tested AC and DC values

Utilization category / Time constant	No. of contacts in series	Off or change-over switch	Voltage (V)	AC / DC	Current (A)
T=50ms	3	ON - OFF	90	DC	5
T=50ms	3	ON - OFF	140	DC	2
T=50ms	3	ON - OFF	180	DC	1
T=50ms	3	ON - OFF	330	DC	0,40
T=50ms	4	ON - OFF	95	DC	12
T=50ms	4	ON - OFF	120	DC	5
T=50ms	4	ON - OFF	190	DC	2
T=50ms	4	ON - OFF	240	DC	1
T=50ms	4	ON - OFF	440	DC	0,40
T=50ms	5	ON - OFF	120	DC	12
T=50ms	5	ON - OFF	150	DC	5
T=50ms	5	ON - OFF	240	DC	2
T=50ms	5	ON - OFF	300	DC	1
T=50ms	5	ON - OFF	550	DC	0,40
T=50ms	6	ON - OFF	145	DC	12
T=50ms	6	ON - OFF	180	DC	5
T=50ms	6	ON - OFF	290	DC	2
T=50ms	6	ON - OFF	360	DC	1
T=50ms	6	ON - OFF	660	DC	0,40
T=50ms	8	ON - OFF	190	DC	12
T=50ms	8	ON - OFF	240	DC	5
T=50ms	8	ON - OFF	350	DC	2
T=50ms	8	ON - OFF	450	DC	1

Minimal ratings (voltage/current)

Voltage (V)	Current (mA)	Environment conditions	Environment conditions 2	Environment conditions 3
20	5	Ambient air must be free of particular contamination with sulfur and/or sulfurous components such as H2S etc.	In case extraordinary contamination with dust is expected an adequate dust protection is required.	--

Rated short-time withstand current Icw

Time (s)	Current (A)
1	200

Size of conductor

composition of conductor	Min. / Max. value	No. of conductor per terminal	Cross section (mm²) or (AWG/kcmil)	Material of the wire
solid wire	Min.	1	0.75mm²	Copper
solid wire	Min.	2	0.75mm²	Copper
flexible wire	Min.	1	0.75mm²	Copper
flexible wire	Min.	2	0.75mm²	Copper
flexible wire	Max.	2	AWG 12	Copper
flexible wire	Max.	2	2.5mm²	Copper
Single-core or stranded wire	Max.	2	AWG 10	Copper
Single-core or stranded wire	Max.	2	4mm²	Copper
flexible wire with ferrule according to DIN 46228	Min.	1	0.75mm²	Copper
flexible wire with ferrule according to DIN 46228	Min.	2	0.75mm²	Copper
flexible wire with ferrule according to DIN 46228	Max.	2	2.5mm²	Copper

Stripping length

Length (mm)	--
9	

Recommended screw driver

Type of screw driver	Value
Cross Screwdriver	PH1
Slot screwdriver according to DIN 5264	0,8x4

Tightening torque of screws

tightening torque (Nm)	tightening torque (lb-in)
1	9

Power loss per pole

Power (W)
1,40

Mechanical life

No. of operating cycles	Ambient temperature (°C)	Number of stages	Limitations
1000000	-5 - 55	--	Valid for manual operation. Valid for switches without optional extras. The value refers to the mechanics of the device, for lifetime of the electrical contacts please refer to "electrical life values". One operating cycle means 0-1-0.

Electrical life (B10-Value)

Utilization category	cos(φ)	Time constant (ms)	Voltage (V)	Current (A)	No. of operations	number of series contacts	AC/DC	No. of phases	No. of poles
--	0,56	--	119	15	80000	1	AC	1	1
--	0,59	--	122	10	150000	1	AC	1	1
--	0,59	--	220	10	100000	1	AC	1	1
--	0,95	--	220	10	80000	1	AC	1	1
--	0,59	--	220	15	50000	1	AC	1	1
--	0,64	--	220	20	30000	1	AC	1	1
AC-23	--	--	440	15,50	30000	1	AC	3	3
--	--	55	110	1	50000	1	DC	1	1

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Electrical life (B10-Value)									
Utilization category	*cos(φ)*	*Time constant (ms)*	*Voltage (V)*	*Current (A)*	*No. of operations*	*number of series contacts*	*AC/DC*	*No. of phases*	*No. of poles*
--	--	55	110	1,50	25000	1	DC	1	1

Degree of protection
IP - Code switch terminal
IP20

Conditions during transport and storing		
Minimum temperature (°C)	*Maximum temperature (°C)*	*additional requirements*
-40	85	In case of temperatures below -5°C no shock load permissible

Shock / Vibration	
Type of oscillation	*Values*
Resistance to shock	min. 5g, 30ms
Resistance to vibration	IEC 61373 (1999) Category 1, Class B

General Information
Text
- Do not lubricate or treat contacts.
- Switches may only be mounted, connected and set into operation by qualified persons according to the accepted rules of technology.
- Use copper wire only. Do not coat the wire end with tin.
- Terminals with factory fitted jumper links are tightened during production. Take care during installation to ensure factory fitted links are not lost by undoing both sides of linked terminals. After wiring, all terminal screws must be tightened to recommended torque specifications.
- After installation of the switches the spacings between the terminals must be sufficient to fulfill the requirement of the applicable standards.

Creepage distance
Distance (mm)
12,70

Clearance
Distance (mm)
9,50

Distance of stages
Distance (mm)
14

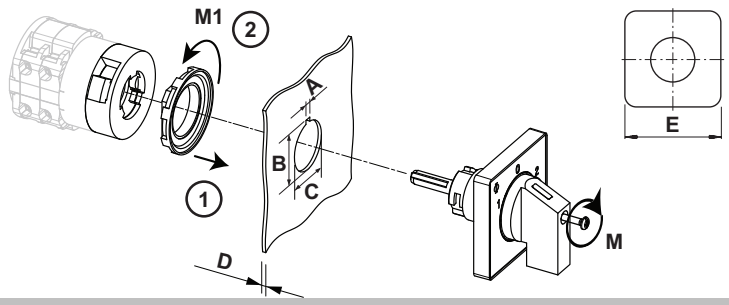
Operating temperature	
Min. Temperature [°C]	*Max. Temperature [°C]*
-25	60

Waste Electrical & Electronic Equipment (WEEE)	
Picture name	*Description*
	Do not throw in the trash as care must be taken to ensure environmentally sound disposal and recycling. Please either use an environmentally friendly waste disposal company; return to the supplier for disposal; or return direct to the manufacturer, Kraus & Naimer. You can find local Kraus & Naimer offices at www.krausnaimer.com

Proposition 65	
Picture name	*Description*
	WARNING: This product can expose you to chemicals including nickel and lead, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Classification Contact: Rigid contact bridge
Classification Contact Mat: Silver
Classification Terminal: Screw terminal

Mounting-FT2



IP - Code front side		IP66, IP67, IP69k
Stages		1,00 - 12,00
A	⊢	3,20 mm
A+_tol.	⊢	0,20 mm
A-_tol.	⊢	0,00 mm
B	⊢	24,10 mm
B+_tol.	⊢	0,40 mm
B-_tol.	⊢	0,00 mm
C	⌀	22,30 mm
C+_tol.	⌀	0,40 mm
C-_tol.	⌀	0,00 mm
D	⊢	<= 6,00 mm

	E	□	48,00 mm
	M	$\vec{M}$	0,50 Nm
	M1	$\vec{M}$	1,80 Nm

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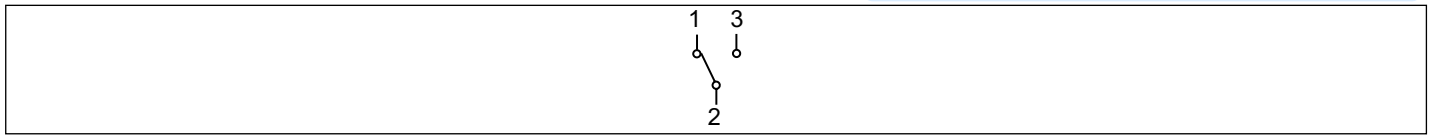
Wiring diagram

CH10.A220.FT2



Switch program

CH10.A220.FT2

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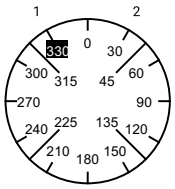
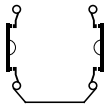
CH10	A220 E	Page 1 of 1

Face Plate





Switching Angle 60
Total switching Angle 60

		1	3	5	7	9	11	13	15	17	19	21	23
		2	4	6	8	10	12	14	16	18	20	22	24
1	330	■											
	345												
	0												
	15												
2	30		■										
	45												
	60												
	75												
	90												
	105												
	120												
	135												
	150												
	165												
	180												
	195												
	210												
	225												
	240												
	255												
	270												
	285												
	300												
	315												

Version: 106

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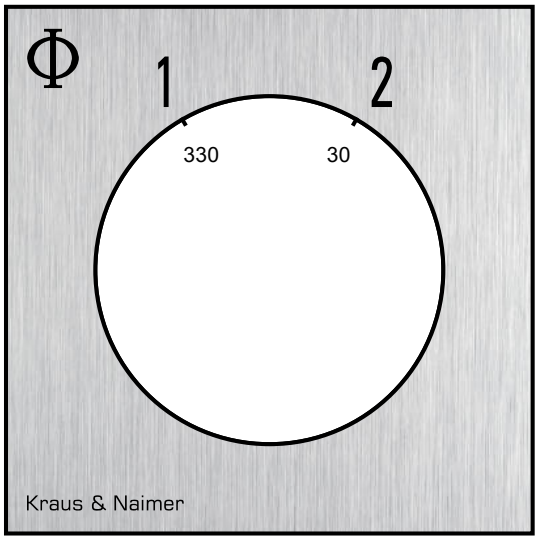
Face plate

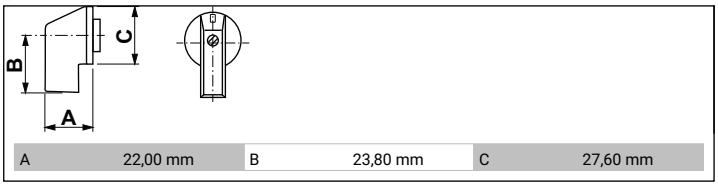
S0.F072/A10.E1L



Kraus & Naimer

HANDLES

Designation: S0C.G251
Handle colour: "1" black



A	22,00 mm	B	23,80 mm	C	27,60 mm