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UTXvA

UNIVERSAL AUTONOMIC MV PROTECTION RELAY

UTXvA protection relay consists of **µUTXvL** module cooperating with **UTXvCTC** type container charged with fault current.UTXvA protection is intended for protecting CB Bays which operate with earthed neutral point in any configuration. It provides quick and effective CB tripping while any: PTP, PTG fault or guaranteed voltage fading will be detected. Reliable operation of the device is based on precise and quick analog value measurements, resulting in fast (voltages, currents, Earth Fault Admittance) vectors finding.
UTXvA is equipped with: 14 Bit A/C converters, serial transmission interfaces (RS 232 or RS 485 – using IEC 870-5-103 standard protocol), with optional optical fibre and/or network communication – TCP/IP.
Individually configured UTXvL relay is intended for protecting CB Bays (Overhead Line/ Underground Cable, Feeding HV/MV Power Transformer, Auxiliary Voltage MV/LV Transformer, MV Bus Coupler, Capacitor Bank).

Device characteristics – µUTXvL module

- multi-processor digital measuring and decision-making system equiped with three groups of protection settings
- galvanically insulated inputs and outputs (analog and digital)

50/51/51A/67 – four overcurrent measuring stages for each phase: directional or non-directional (4 x I>)
59 – two phase overvoltage stages (2 x U>)
27 – two phase undervoltage stages (2 x U<)
32 – one reverse active overpower stage (P>)
32VAR – one reactive power stage (Q<>, tg<>) for compensation purposes
50N/51N – three: independent, non-directional earth fault overcurrent stages (3 x IE > T)
59N – three residual overvoltage (neutral displacement) stages (3 x UE > T)
67N – two sensitive earth fault overcurrent stages (2x Iedir.>T)
21N – one sensitive earth fault admittance stage (RYe, RBe, Rge)
21N – one sensitive earth fault admittance differential stage (RYYe)
50/51 – two non-directional overcurrent stages – for internal faults (2 x Iy > T)
46/47 – negative sequence overcurrent and overvoltage protections
50H/51H(2) – second harmonic phase current compound detector
50/51 – simplified overcurrent substation bus protection function
50BF/51BF – freely programmable substation circuit breaker failure protection function
81L/81H – four internal Underfrequency Load Shedding and two AR after Underfrequency Load Shedding stages (4 x LS + 2 x ARLS)
- four external Underfrequency Load Shedding and AR after Underfrequency Load Shedding stages (4 x LS + 4 x ARLS)

79N – neutral point – automatic resistance insertion logic
79C/86 – capacitor bank automatic switching logic
79(3) – four shot, six mode, three pole AR cycle for any protective or logic function
74 – station signalling functions: BDI, AL, EMT
30/74TC – fully programmable digital inputs for signals from external protection relays
11 – CB switching onto fault (SOTF) protection logic
33 – LCD bay terminal screen, displaying actual (CB, bus and line reclosers, earthing switches) status
- each protection stage can be set as signal operating only (operational report)
- analog signal vector stabilization and compensation (due to unstable fault evolving) for precise and selective fault detection
- permanent monitoring of bay internal element operational status/ condition
- three-level password protection
- event and disturbance recording (4 x U; 4 x I; 16 x digital signals)
- analog signal synchro-sampling and external clock synchronization
- permanent monitoring of CB operational circuits (1 x ON; 2 x OFF)
- CB internal operational status (ready/ failure) monitoring and remote control
- analog signal/ value (I, U, S, P, Q, f, Ep, Eq) front panel (local) visualisation and remote data transfer
- CB currents tripping (per phase bassis) cumulative function, number of operations and protection relay operating time
- detailed fault monitoring, for local/remote fault clearance evaluation
- graphic LCD display, 8-key keypad and 12 LEDs (11 freely programmable)
- four quadrant energy counters
- 24 logic functions with programmable modifiers for realization of simple and complex algorithms
- possibility of visualization, control and configuration by SAZ 2000 program
- possibility of cooperation with Alice`79 system

Basic technical parameters – uUTXvL module

Typical µUTXvL activation time
20ms – for module pick-up (e.g. Directional overcurrent phase protection relay),
40ms – for vector pick-up (e.g. Protection relay admittance),
100ms – for frequency pick-up e.g. LS),

Analog inputs
Nominal current inputs (In) – 1A or 5A
Nominal voltage inputs (Un) – 57,7V
Current inputs max. power consumption – 0.2 VA (for I=1In)
Voltage inputs max. power consumption – 0.04 VA (for U=1Un)
Inputs insulation resistance – 3kV AC/DC, 5kV impulse 5us
Analog inputs number – 8 (IL1, IL2, IL3, IE, UL1, UL2, UL3, UE)
Measuring range:
for IL1, IL2, IL3 – 50 In
for UL1, UL2, UL3, UE – 3 Un
for IE - 1,10A
Overload resistance:
for voltage inputs – 3Un fixed
for current inputs In=1A – 85In/1s, 5In fixed
for current inputs In=5A – 70In/1s, 2In fixed
Dynamic resistance:
for In=1A – 250In/20ms
for In=5A – 200In/20ms

Binary inputs
Inputs insulation resistance – 3kV AC/DC, 5kV impulse 5us
Maximal current consumption – 5mA
Binary inputs nominal voltages Up – 110VDC or 220VDC (Max: 160VDC or 300VDC)
Binary input voltages range for logic "0" – 0.0Up to 0.3Up
Binary input voltages range for logic "1" – 0.9Up to 1.3Up
Binary inputs number:
Up to 28 freely programmable

Binary outputs
Contacts connecting resistance:
Card with 8 relays: for 250VAC – 8.0A, for 250VDC – 0.30A
Card with 14 relays: for 250VAC – 6.0A, for 250VDC – 0.18A
Binary outputs number:
Up to 18 freely programmable + 2 dedicated („Bay Defect Indicator", „ALarm")

Allowed inputs/outputs configuration
K0: 14 inputs, 8+2 outputs,
K1: 28 inputs, 18+2 outputs,

Housing type
Surface mounting/ flush mounting: 3U-28
Max. cassette weight: 4[kg]
International Protection Rating: IP40 /optional IP65/

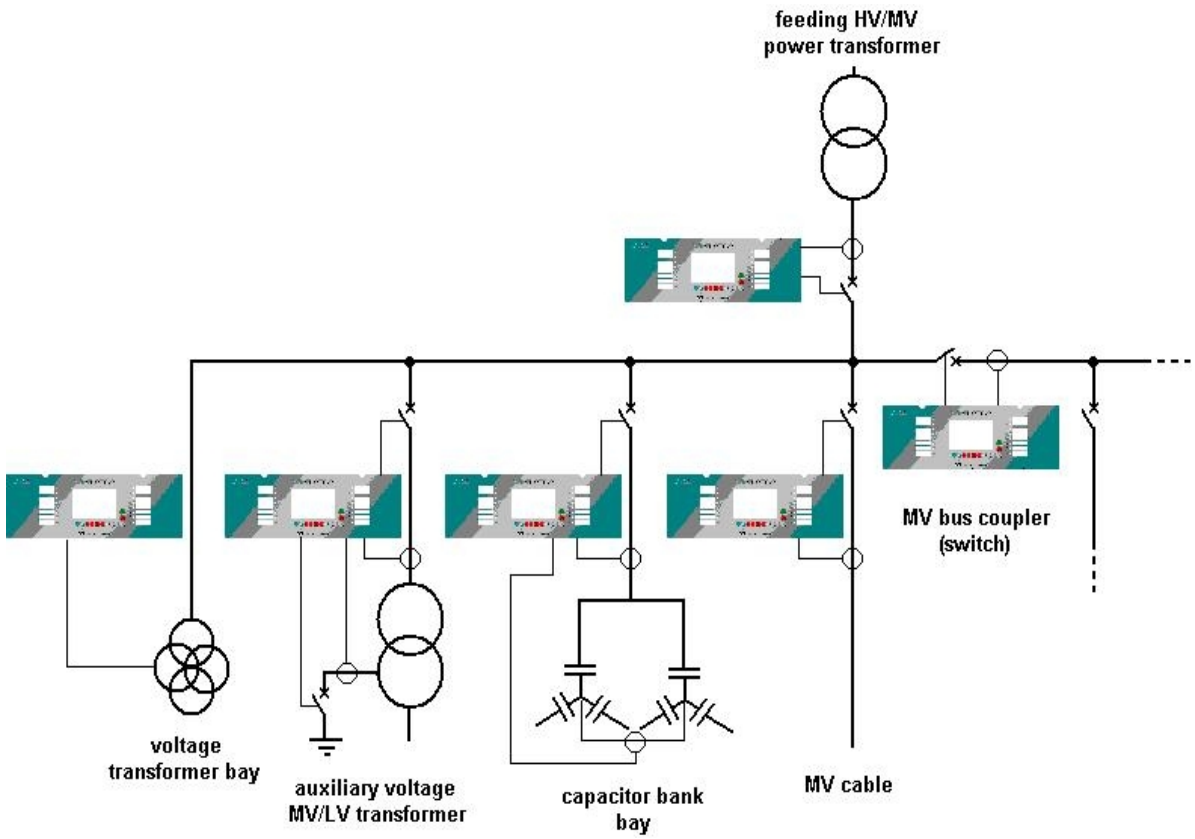
Allowed ranges
Power supply input voltage: from 90VDC to 340VDC or from 65VAC to 240VAC
Working temperature: from 0°C to +40°C
Storage temperature: from od -10°C to +70°C
Working and storage humidity: 40% to 80%

Communication ports
CCBus interface (for superior system and automation):
ST option, optical multi-mode (or FC single-mode), RS232, CL (current loop), Ethernet (independent channel),
IEC 60870-5-103 interface (for superior system):
ST option, optical multi-mode (or FC single-mode), RS485
CANBUS interface (for superior system):
2 x RS485 (channels: basic and spare)

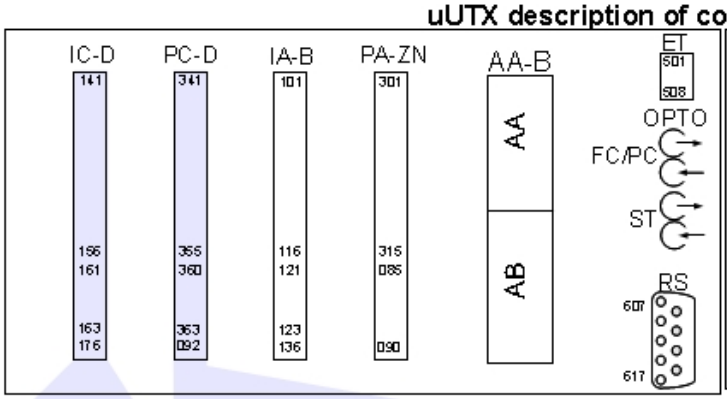
Fault recorder
Maximal capacity: 8 events
Number of registered analog inputs: 8
Number of registered binary inputs: 16
Pre-failure and failure time: programmable 0 to 4600 ms

Event recorder
Event recorder capacity: min. 1000 records

Standards
PN-EN 50263
PN-EN 60255-22-2
PN-EN 55022
PN-IEC 60255-22-4 i PN-EN 61000-4-4
PN-EN 60255-22-5 i PN-EN 61000-4-5



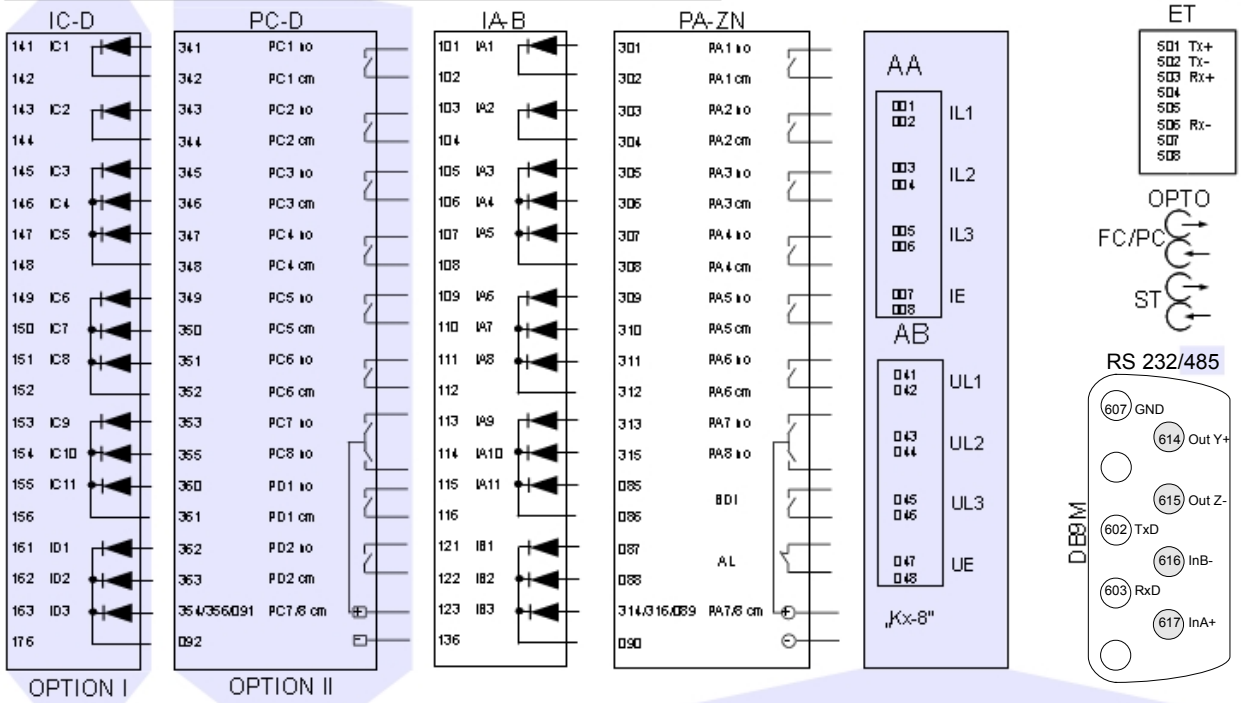
uUTX description of connectors

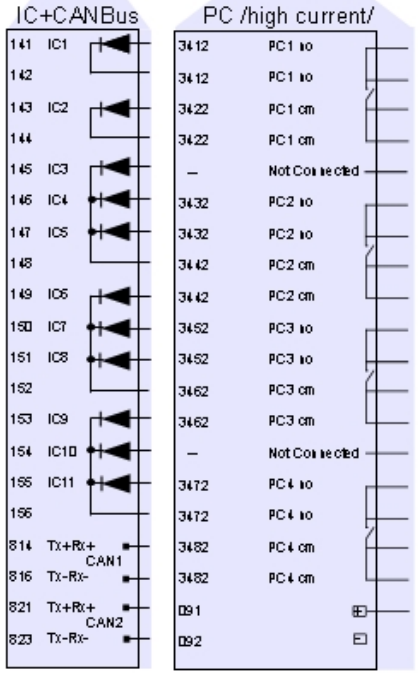


Analog inputs - AA+ AB conn. - up to 8 channels
Binary inputs - IA module conn. - 1+1+3+3+3 inp.
Binary inputs - IB module conn. - 3 inp.
Binary inputs - IC module conn. - 1+1+3+3+3 inp.
Binary inputs - ID module conn. - 3 inp.
Binary outputs - PA module conn. - 8 relays
Binary outputs - PC module conn. - 8 relays
Binary outputs - PD module conn. - 2 relays

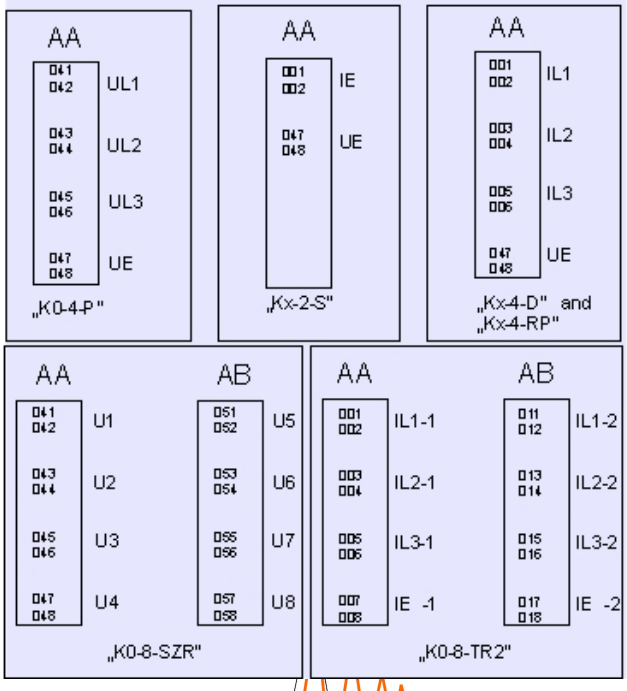
2 separated & independent power supply inputs available

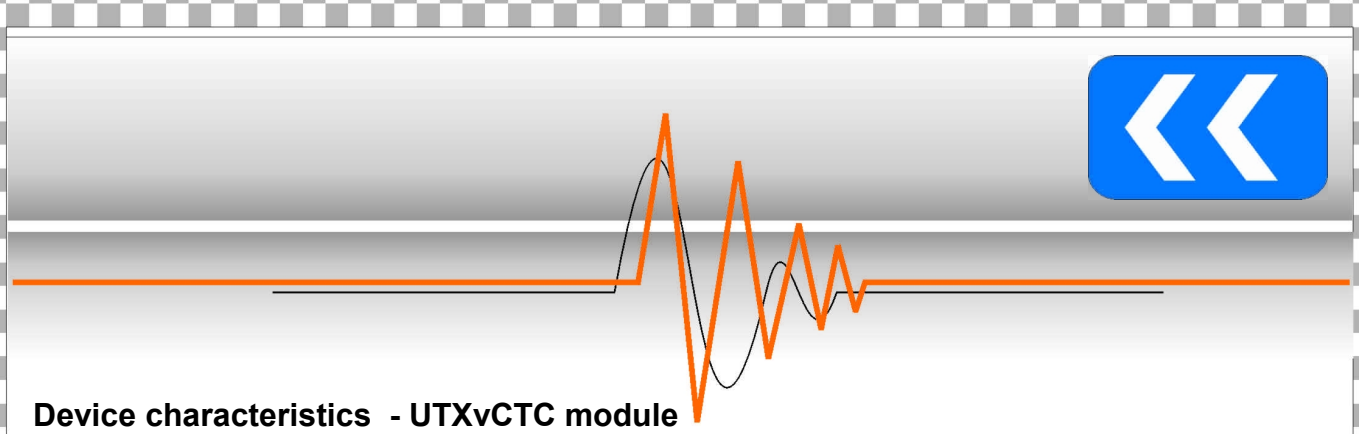
OPTION I
ID module replaced by CANBus interface module
OPTION II
High current binary outputs - PC connector - 4 relays
OPTION III
Opto interface (CC/AABus or TRBus or IEC103)





Other possible analogue inputs configuration:





Device characteristics - UTXvCTC module

Rated current	1[A] or 5[A], clamp terminal choice
Rated frequency	50[Hz]
Current circuit permanent load capacity	2 * In
Rated auxiliary voltage	from 90[V]DC to 340[V]DC from 65[V]AC to 240[V]AC
Current circuit power consumption for I = In	<20 VA/phase
Power consumption from auxiliary voltage source	<25 W
Starting current for autonomous mode:	
for three phases feeding by fault current	nearly 0,45 In
for single phase feeding by fault current	nearly 1,1 In

Approximate time for readiness to operation in autonomous mode, for three phases feeding by fault current

In	[s]
0,45	9,5
0,5	6
0,75	3,8
1	2,8
1,5	2
2	1,8
2,5	1,6
3	1

Approximate time for readiness to operation in autonomous mode, for single phase feeding by fault current

In	[s]
1,1	16,5
1,2	11
1,5	5,8
2	4,6
2,5	2,4
3	2,2

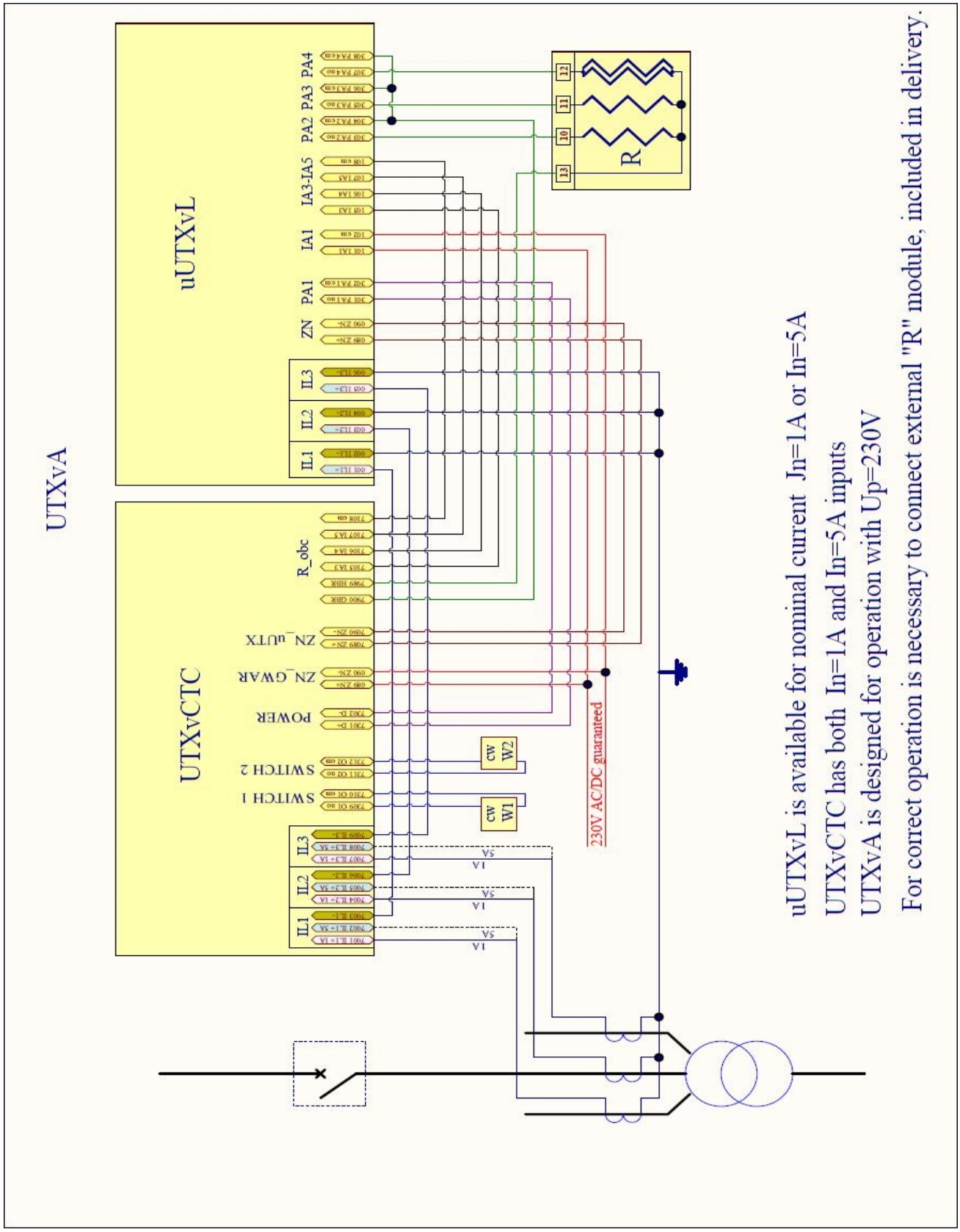
Cooperation with switch equipped with switching off coils. The coils parameters:

- rated voltage	220 V
- power consumption	<600 W
- resistance	>80 ohm

Insulation electrical resistance	2kV
Executive relays	RM 84
- fixed current load capacity	8 [A]
- AC/DC contacts max. voltage	400 [V]/300 [V]
- contacts min. voltage	10 [V]
- contacts min. current	5 [mA]
- circuit opening at lagging load (L/R = 40 ms)	0,12 [A]/250 [V] DC
- max. operational power for AC1 category	2000 [VA]
- test voltage of contact separation	1000 [V] AC

Working conditions	from -5˚C to +50˚C
Storage conditions	from -10 ˚C to +60˚C
UTXvCTC weight	5 [kg]
International Protection Rating	IP55
Dimensions	300x230x110 [mm]

APPLICATION SCHEME



Standards:

No.	Test type	Standard	Tested elements	Testing scope
1	Electrostatic discharge immunity	PN-EN 50263:2002 PN-EN 60255-22-2:1999	Through-housing access port	-6/8kV for contact discharges -8/15kV for through air discharges
2	Quick electrical transients resistance	PN-EN 50263:2002 PN-IEC 60255-22-4:1996 PN-EN 61000-4-4:2005	Power port I/O ports	class III – 2kV class IV – 4kV
3	Surge resistance	PN-EN 50263:2002 PN-EN 60255-22-5:2003 PN-EN 61000-4-5:2006	Power port I/O ports	class III : - common-mode voltage – 2[kV] - differential voltage – 1[kV]
4	Electromagnetic fields interference resistance	PN-EN 60255-22-3:2002	Device	- frequency: (900 ± 5) [MHz] - electromagnetic field level: 10 [V/m]
5	Resistance to conducted interference induced by radio-frequency fields	PN-EN 60255-22-6:2004	Power port I/O ports	- frequency: 0,15< f < 80 [MHz] - amplitude 10[V] unmodulated r.m.s. - source impedance: 150 [Ω]
6	Sinusoidal vibrations resistance	PN-EN 60068-2-6:2002	Device	- frequency: (10-150)[Hz] - acceleration: 5[m/s^2] (rms)
7	Tolerance to cold	PN-EN 60068-2-1:2007(U)	Device	Temperature: (-5)˚C 1. Temp. decrease time 60 [min.] Test duration 1[h] 2. Temp. decrease time 25 [min.] Test duration 16[h] 3. Initial temperature (-5)˚C Test duration 1[h]
8	Tolerance to dry heat	PN-EN 60068-2-2:2002	Device	Temperature: (+50)˚C 1. Temp. increase time 30 [min.] Test duration 96[h]
9	Resistance to cold	PN-EN 60068-2-1:2007(U)	Device	Temperature: (-10)˚C Test duration 96[h]
10	Resistance to dry heat	PN-EN 60068-2-2:2002	Device	Temperature: (+60)˚C Test duration 96[h]

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