



UTU ARC PROTECTION SYSTEMS

– a possibility to be protected

An electrical arc is a rarely appearing fault in switchgear. However, the explosive thermal and pressure effects may cause considerable material damage and jeopardise the safety of the personnel.

ONLY THE FAST ARC PROTECTION IS EFFECTIVE ENOUGH

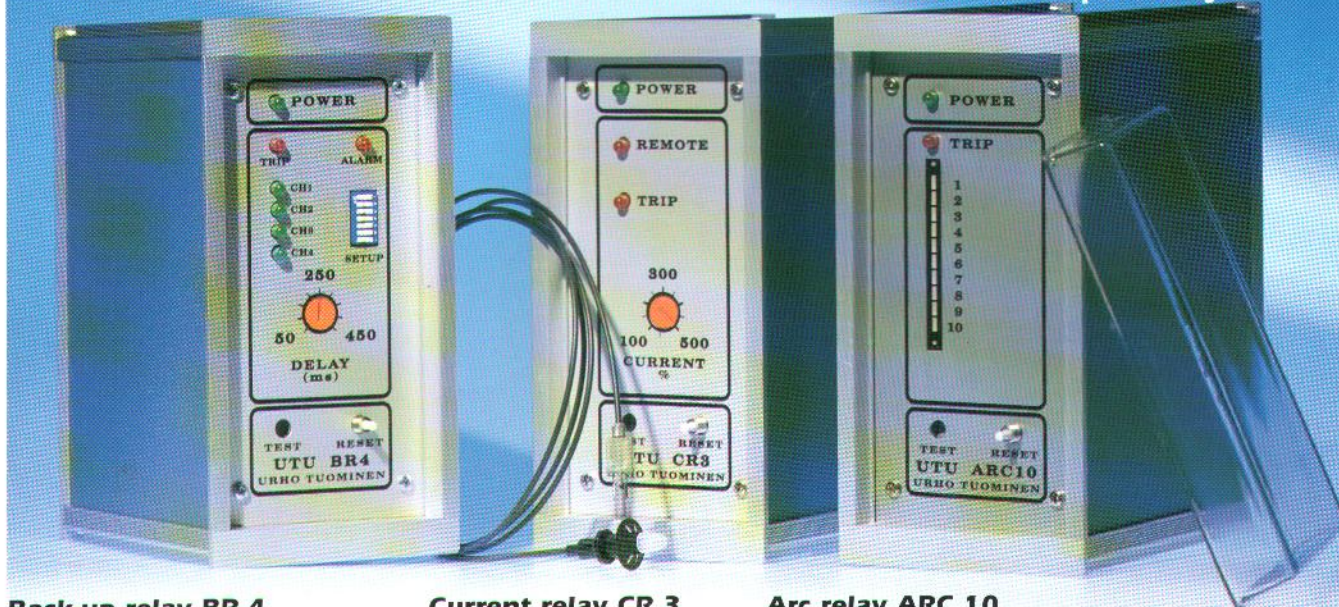
The aim is to protect people and goods in case of an electrical arc. The protection is realized by measuring nascent light in the switchgear with the help of fibre optic cable and an arc relay. If the current relay detects over current at the same time, the light is decoded as caused by an electrical arc. When the arc is detected, relays discharge the breaker of the switchgear very quickly (**< 1 ms**). The speed of the discharge is a crucial factor in effective limitation of damage.

ARC Protection

URHO TUOMINEN OY

UTU ARC protection The élite in protection systems

- light and current requirements
- the breaking command through a strong fibre optic cable
- easy and fast to install
- flush mounting to the door
- selective function possibility



Back-up relay BR 4

Back up relay BR4 confirms the functions of the system as well as trips the upper level circuit breaker, if the system has failed to trip the supply circuit breaker within a given time and the arc is still on. BR 4 monitors also the connections between relay units in the system.

Current relay CR 3

The current relay CR 3 is connected in series with the arc relay ARC 10. CR 3 measures the current with the help of current transformers. A disconnection impulse is given when both light- and current requirements are attained.

Arc relay ARC 10

ARC 10 is the base component in the system. 10 light sensors can be connected to it, and with a cable triplexer as many as 30 light sensors. The light sensors are at the end of the optical fibre cable, which is equipped with light absorbing diffusion filters. The type of diffusion filter determines the light sensitivity of the system. The sensors are installed in the switchgear to measure appearing light. ARC 10 can be delivered with a relay that controls the auxiliary voltage.

Technical data

ARC PROTECTION RELAY

Type: UTU ARC 10

Auxiliary voltage:
24-240 VDC or 230 VAC

Inputs:

10 channels max. 100 m
optical fibre cable /channel
3 pcs

Outputs: 1, 2 and 4

Power consumption:
DC 7 W
AC 4 W

Dimensions:

W 92 * H 186 * D 150
(DIN 37500)

CURRENT RELAY

Type: UTU CR 3

Auxiliary voltage:
24-240 VDC or 230 VAC
Settings: Current settings
50...500% * In

Inputs:

3 current transformers for
current measurements
3 pcs In=5 A, 2 A or 1 A

Outputs: 1, 2 and 4

Power consumption:
DC 6 W
AC 3 W

Dimensions:

W 92 * H 186 * D 150
(DIN 37500)

BACK-UP RELAY

Type: UTU BR 4

Auxiliary voltage:
24-240 VDC or 230 VAC
Settings: Time delay setting
50...450 ms

Inputs:

4 optical fibre cable inputs
from ARC 10, 1
optical fibre cable input from CR 3

Outputs: 2, 3 and 4

Power consumption:
DC 7 W
AC 4 W

Dimensions:

W 92 * H 186 * D 150
(DIN 37500)

OUTPUT, TYPE 1

TRIAC 5 A 600 Vp (25 A < 1 s)
triac I rms = 25 A
V_{DRM} = 600 V (I_{TSM} = 175 A)
Min. load 100 mA parallel
RC-circuit 0,1 uF 47 ohm
Tripping time < 1 ms

OUTPUT, TYPE 2

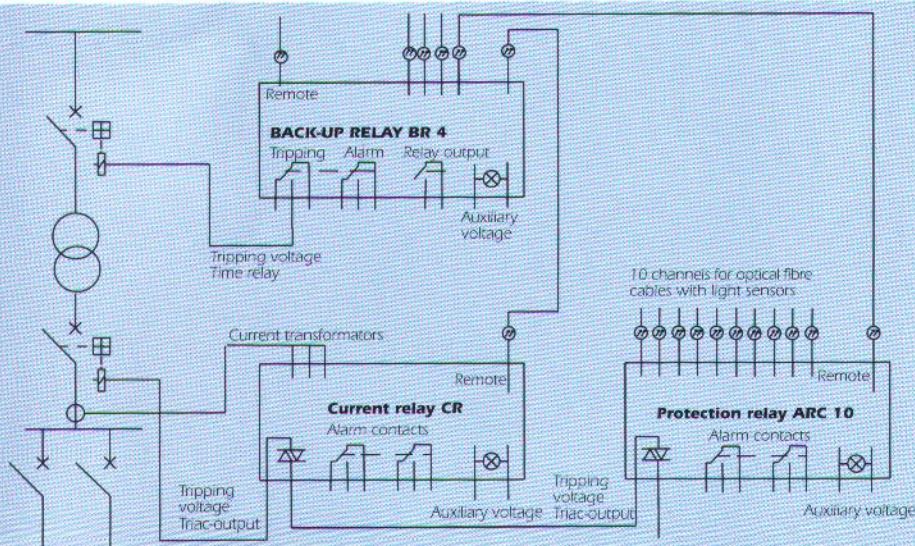
Relay output; 2 potential free
changeover contacts
Relay 5 A 250 VAC
Tripping time 10 ms

OUTPUT, TYPE 3

Relay output; 1 potential free
closing contact
Relay 5 A 250 VAC
Tripping time 10 ms

OUTPUT, TYPE 4

Light transmitter ARC 10 + CR 3;
remote to BR 4, BR 4;
remote to other units
There is light in the cable in
normal conditions
Tripping time < 1 ms





Falcon offers many unique benefits

- the benefits of ARC protection system
- programmable selective breaking logic
- continuous comprehensive selftesting
- many separate switchgear can be protected with just one system
- light sensitivity is adjustable to desired level
- up to 256 protection channels !
- flexible programmable for different kind of connection situations

UTU-Falcon protection system consists of three different units

- The UTU-Falcon master unit, that navigates and controls the system
- The Falcon-ARC light unit to which the light information is sampled and
- The Falcon-CR current unit that measures the current in the switchgear

The units are connected to each other with data transmission and optic cables. The breaking command proceeds without noise through the optical fibre cable. The information about the condition of the system proceeds through the data transmission cable, via which the system can be connected to a PC.



There are 10 optical cable inputs in **Falcon-ARC**. Light sensitivity can be adjusted from 10 klux to 50 klux.

The UTU-Falcon master unit works with programmable logic. With the master unit 4 breakers can be navigated directly. With quick relays the breaking command can be multiplied to activate more breakers simultaneously. 24 units from controlled areas can be connected to four channels in the master. All channels can be programmed with different parameters. In the master unit display the position of possible electric arc can be located as well as light and/or where there has been overcurrent.

Technical data

UTU-FALCON MASTER UNIT

Type UTU-Falcon

Channels 4 data transfer channels to 24 light and current unit is parallel with tripping optical fibre cable

Inputs:

*4+16 optical fibre cable with filtered light sensors

Outputs:

*4 pcs triac outputs and

*6 pcs relay outputs to open circuit breakers

All outputs are free to be programmed

Auxiliary voltages: 12 VDC

Power source's auxiliary voltages

85-265 VAC, 110-350 VDC

Power requirement: 6 W

Dimensions:

W 92 * H 196 * D 172 mm

Installing: Flush mounting to door

FALCON ARC LIGHT UNIT

Type Falcon ARC

Inputs:

*10 pcs, recommendation max.

100 m/optical fibre cable

*1 pcs data transfer cable

*1 pcs optical fibre cable for tripping

Outputs:

*1 pcs data transfer cable

*1 pcs optical fibre cable to tripping

Auxiliary voltages: 12 VDC from main unit

Power requirement: 1 W

Dimensions:

W 160 * H 105 * D 44 mm

Installing: DIN-rail or by screws

FALCON CR CURRENT UNIT

Type Falcon CR

Inputs:

*3 pcs In 1, 2 and 5A in same relay

*1 pcs data transfer cable

*1 pcs optical fibre cable for tripping

Outputs:

*1 pcs data transfer cable

*1 pcs optical fibre cable to tripping

Settings: Over current settings 50...500% * In

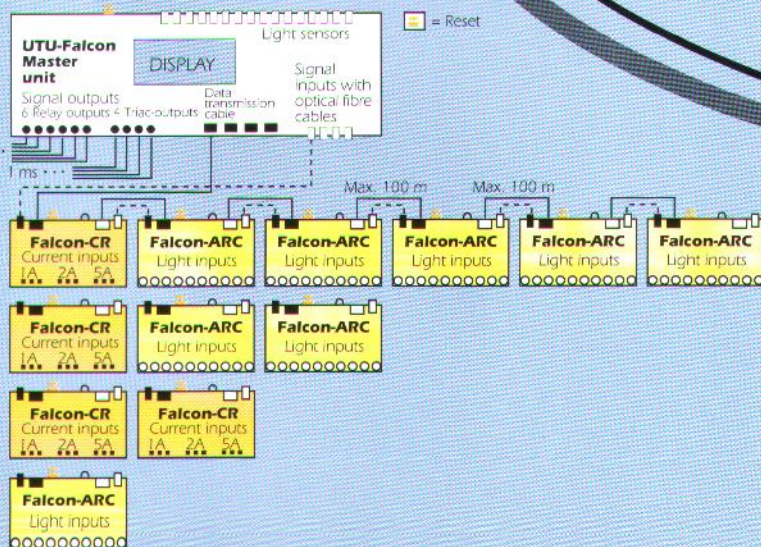
Auxiliary voltages: 12 VDC from main unit

Power requirement: 1 W

Dimensions:

W 160 * H 105 * D 44 mm

Installing: DIN-rail or by screws



1, 2 and 5A current transformers can be connected to the **Falcon-CR Current unit**. Transformers of different values can also be connected to the same channel.



Picture The switchgear was without an arc protection system when an electric arc occurred. There was voltage in the crossing bus bars until it was disconnected. With arc protection, material damage is minimized and the safety of the personnel is increased.

Fibre optic guarantees a noise-free system.

Fibre optic cables are used in UTU Arc Protection systems. The fibre optic cable (HFBR-EUS) is a single fibrous plastically fibre optic cable that is easy to install and handle. When handling the cable no special protection gloves or other protection equipment are needed. The cable can be delivered in fixed lengths or as a meter product.

A light sensor is connected to the end of the cable, in order to sense surrounding light. The sensor consists of an optic cable adapter and a diffusion filter.

Fibre optic guarantees a minimal reaction time for the arc protection system. The breaking time is crucial in minimizing the range of the damage - the shorter the breaking time, the smaller the damage. The total breaking time consists of the breaking time of the arc protection system and that of the breakers.

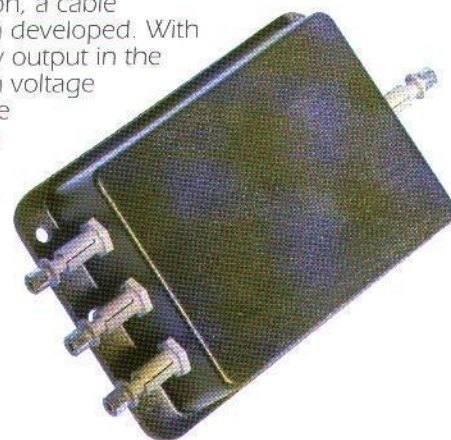
Easily installed in both old and new switchgears

In developing the system we have taken in consideration not only optimal protection but also the wish to make the system as easy to install and handle as possible. There is no need for special installation material because we deliver the system ready installed or as an installation package.

Both UTU systems are tested according to EMC-directives and they have a CE-mark. Urho Tuominen Oy Ltd has been awarded the ISO-9001 quality certificate.

UTU offers the fastest systems on the market - economically

UTU Arc protection systems are suitable for both medium and low voltage switchgear. UTU systems are the fastest on the market and also protect well old switchgear. In order to optimize protection, a cable triplexer has been developed. With the triplexer every output in the low- and medium voltage switchgear can be protected - more economically than ever before.



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