



Intelligent Voltage Information System IVIS and IVIS-F

Operating Instructions
No. 531 751, Edition 01/99

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IVIS and IVIS-F (IVIS-F is an IVIS with remote control contacts) Intelligent Voltage Information System

IVIS is an electronic voltage detecting system in compliance with E DIN VDE 0682 part 415 or IEC Publication 61243-5 with integrated display unit. The conformity with this specification has been tested and confirmed by the Industrial Injuries Insurance Institution for Light and Electrical Engineering. IVIS is also provided with the capability for phase comparison.

IVIS is suitable for determination of the neutral condition in accordance with the five safety rules of DIN VDE 0105, part 1, whereby the change of the display must be regarded during safety disconnection.

If this is not possible, make-proof earthing switches are necessary.

The IVIS tests continuously:

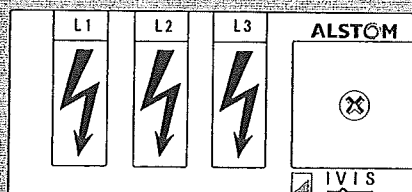
1. For conductor voltage,
2. The conditions, on which the repeat test is based in compliance with E DIN VDE 0682 part 415 or IEC Publication 61243-5.

In compliance with E DIN VDE 0682 part 415, or IEC Publication 61243-5, Section 5.28, the IVIS requires no repeat test.

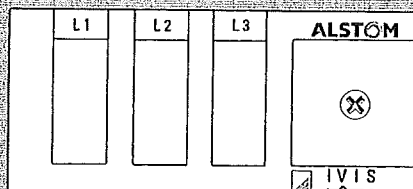
In the service voltage range for which it is laid out, the IVIS operates faultlessly. The manufacturer must be consulted in case of change of rated voltage.

DC or AC voltage tests do not impair the IVIS system.

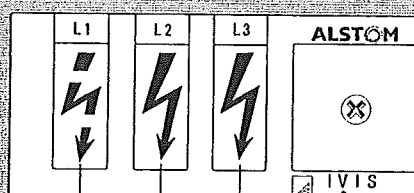
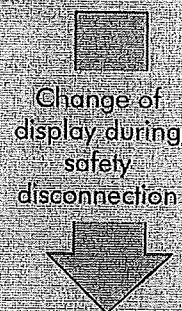
The test for compliance with limit values specified in the rules of electrical engineering required by the German Industrial Injuries Insurance Institution for Light and Electrical Engineering in VBG 4 consists of checking that the high-voltage flash symbols are continuous and uninterrupted when the full operating voltage is applied.



Service voltage phase L1, L2, L3 is applied.



Phase L1, L2, L3 is dead if, after safety disconnection, the lightning symbols of all three phases shown earlier, are no longer displayed. Even parts of the lightning symbols should not be visible.



The lightning symbols are provided with an integrated system test, which works when service voltage is applied.

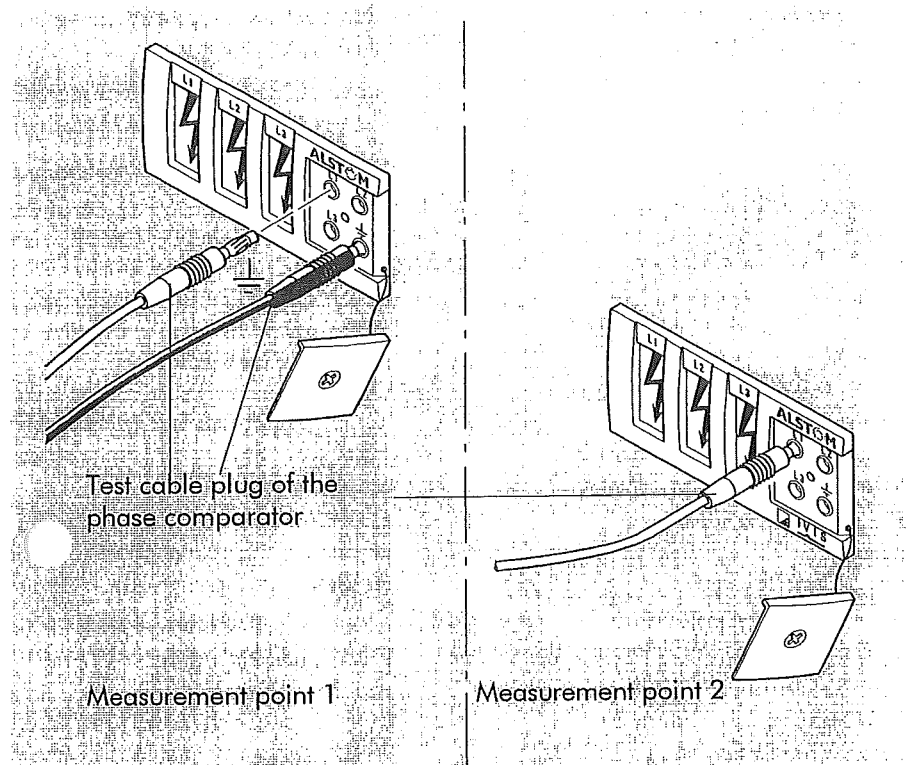
When **full** service voltage is applied, an IVIS operating satisfactorily in the sense of DIN VDE 0105, part 1 displays **continuous and uninterrupted** lightning symbols. In the example IVIS is working properly in phases L2 and L3.

In the example, service voltage is applied in phase L1 but in phase L1 the IVIS is not working properly.

Voltage indication takes place in unambiguous manner by the **interrupted** lightning symbol. The switchgear may therefore remain in operation.

Consult manufacturer regarding corrective measures (it may be necessary to replace the IVIS).

Phase comparison



Phase comparison between measurement points 1 and 2 using phase comparator

When full service voltage is applied to the upstream taps of the two measurement points 1 and 2 and the IVIS displays the uninterrupted lightning symbols, phase comparison can be carried out at the IVIS test sockets.

Accepted phase comparison devices: Type MS 100, order No. C26320 or commercial-type LMR comparators in accordance with E DIN VDE 0682 part 415 or IEC Publication 61243-5 without integrated interface testing (IVIS is an integrated, fixed connected system).

Observe operating instructions of the phase comparator!

Please bear in mind that the phase comparator connected to the test sockets may influence the response conditions of the lightning symbols L1 to L3. Individual lightning symbols may be extinguished.

⚠ During the phase comparison no test for neutral conditions is admissible.

The test sockets must be kept closed with the associated lid when tests of the phase equality are not being performed. Fix lid screw only slightly until lid is flush with the housing.

IVIS-F (IVIS-F is an IVIS with remote control contacts)

The conditions of the lightning symbols are reported by two potential-free relay-contacts for remote control.

A **Relay Voltage Condition** **(N/O Contact)**

switches if all 3 phases report neutral condition. The relay does not change over if in at least one phase the interrupted lightning symbol appears.

Range of application: Remote control of voltage condition, interlocking purposes.

The remote control contact is not completely acc. to the requirement of E DIN VDE 0682 Part 415 or IEC Publication 61243-5. Therefore it must not be used for determination of the neutral condition in accordance with DIN VDE 0105 Part 1.

B **Relay System Check** **(N/O Contact)**

switches if the voltage check system operates properly.

The Relay System Check drops out:


1. in case insulation weakness is measured in the voltage check system, that means the lightning symbols of the three phases do not display the same condition, e.g. one phase displays an interrupted lightning symbol. This disturbance can also be reported if during switching operation the voltage in the three phases is not switched on or off within 10 ms.
2. in case of loss of rated supply voltage.
3. in case of break of wires for rated supply voltage or for announcement system check.

On site check at the switchboard with full service voltage.

Procedure if disturbance is reported (relay system check drops out)

1. All IVIS-Displays must display the continuous and not interrupted lightning symbol. In case of interrupted lightning symbols the IVIS is not working properly (e.g. insulation weakness). Voltage indication takes place in unambiguous manner by the interrupted lightning symbol. The switchgear may therefore remain in operation. Consult manufacturer regarding corrective measures (it may be necessary to replace the IVIS).
2. Check rated supply voltage of IVIS-F. The outgoing voltage at the DC/DC or AC/DC transducer is 24 V DC. The LED for readiness for operation must burn. Consult manufacturer regarding measures for exchange.
3. Consult manufacturer regarding further corrective measures.

Range of application: Annunciator contact e.g. for superposed substation control and protection system.

 **The remote control contact for the system check does not replace the check of the lightning symbols on site.**

C **For Processing of the** **Annunciation Signals**

debouncing is requested during 50 ms for the incoming circuit of downstream devices.

Technical Data

Type Tests (IVIS and IVIS-F)

The type tests have been performed in accordance with
E DIN VDE 0682 Part 415 or
IEC Publication 61243-5.

Operating Conditions (IVIS and IVIS-F)

Suitable for normal operating conditions acc. to the specification DIN VDE 0670 Part 1000 or IEC Publication 694. (temperature class „minus 25 indoors“).

Range of operating temperature:
- 25°C up to + 55°C

Operating Data (IVIS-F only)

Rated supply voltage:
24 V DC (+ 15 % / - 15 %)

Maximum current consumption:
60 mA



Because of the internal connection of IVIS-F the negative pole of the rated supply voltage is connected to the earth of the switchboard. Galvanic isolation of the rated supply voltage is recommended for IVIS-F.

Relay Outgoing Circuits (IVIS-F only)

Rated power (resistive):
5 A 250 V AC/ 30 V DC

Maximum switching capacity:
1250 VA/150 W

Maximum switching voltage:
250 V AC/125 V DC

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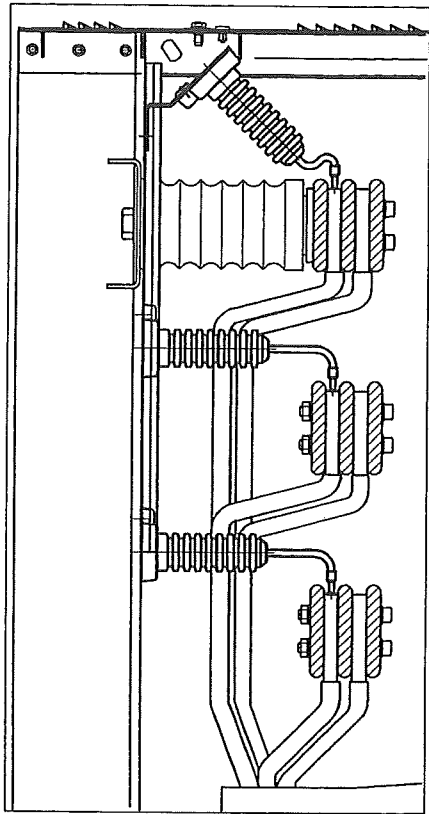
Intelligent Voltage Information System IVIS and IVIS-F

Installation Instructions
No. 531 757, Edition 05/00

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2 Installing the IVIS display	6
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1 Mounting IVIS coupler



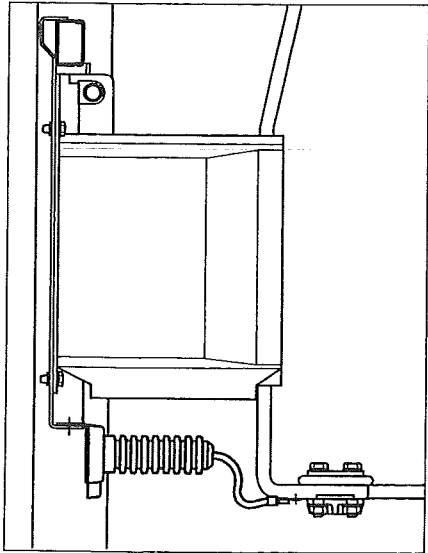
1
Example for mounting IVIS coupler in busbar compartment

A mounting kit is supplied for installation of the IVIS coupler:
Mounting kit: Y80 003

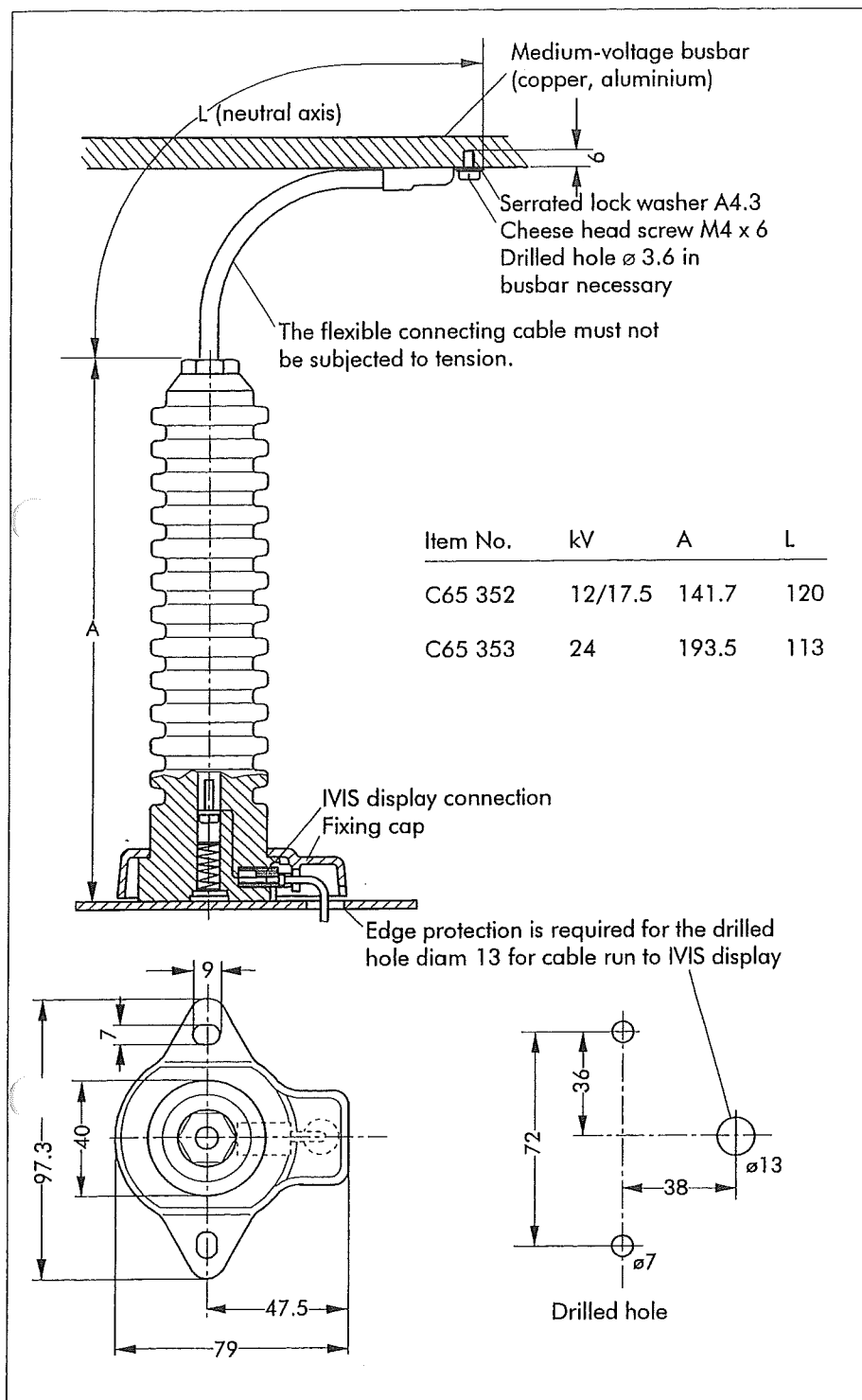
Item No.	Designation	Quant.
C25576	Attachment cap	3
C23334	Insulating cap	3
075024	Push-on sleeve 4.8	3
054479	Ratchet screw M 6x16	6
059615	Ratchet nut M6	6
060521	Raised cheese head screw M4x6	3
060002	Serrated lock washer A 4.3	3

Laying the connection cable (from IVIS display to IVIS coupler) in the longitudinal and transverse posts, on the clad partitions, etc., fixed by means of self-adherent plates (29 x 29) and cable binder.

⚠ The dielectric properties must be checked for each mounting version.



2
Example for mounting IVIS coupler at current transformer in the outgoing cable feeder compartment



3
Dimensions of IVIS coupler

The connection cable to the IVIS coupler may be shortened but not lengthened.

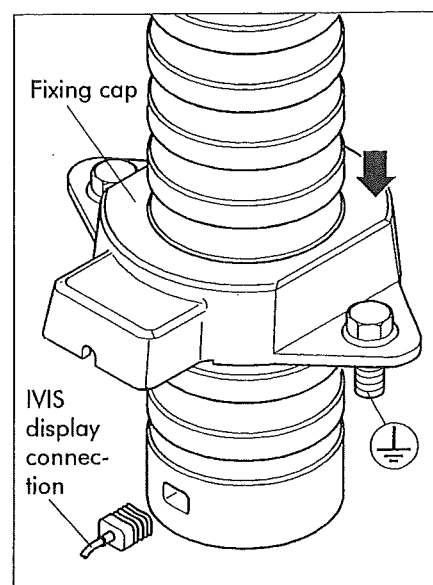
Insert connection cable from IVIS display before bolting IVIS coupler:

L1 = black

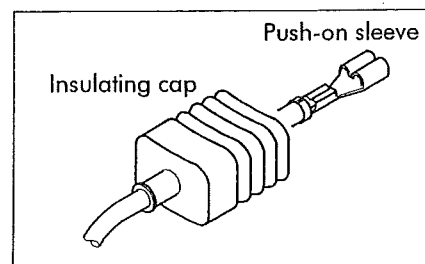
L2 = white

L3 = blue

The bolt connection of the IVIS coupler must be connected to earth.



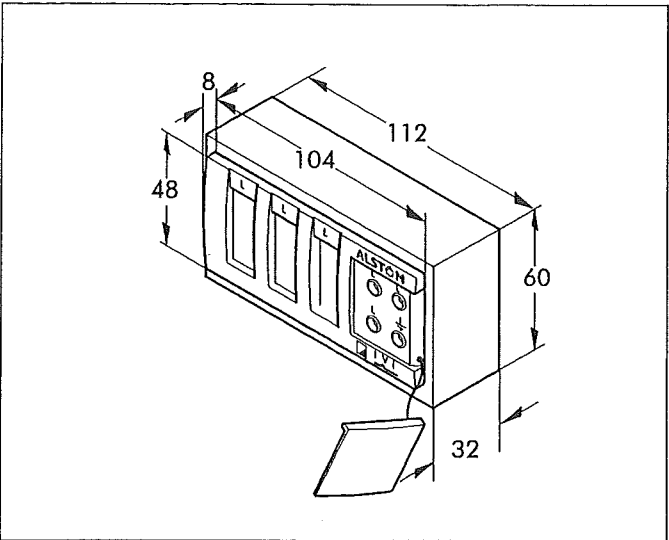
4
Insert connection cable from IVIS display before bolting the IVIS coupler



5
Plug for connection cable

2 Installing the IVIS display

6
Dimensions of the
IVIS display



A mounting kit consisting of the following parts is supplied for the IVIS display:

Mounting kit: Y80 005

Item No.	Designation	Quant.
C65066	Mounting bracket	2
059615	Hex ratchet nut M6	2
057107	Hex nut M6	2
060005	Serrated lock washer A 6.4	2

We recommend the use of the mounting possibility shown in Figs. 7 and 8. If mounting deviates from this recommendation, the following must be observed for the IVIS display:

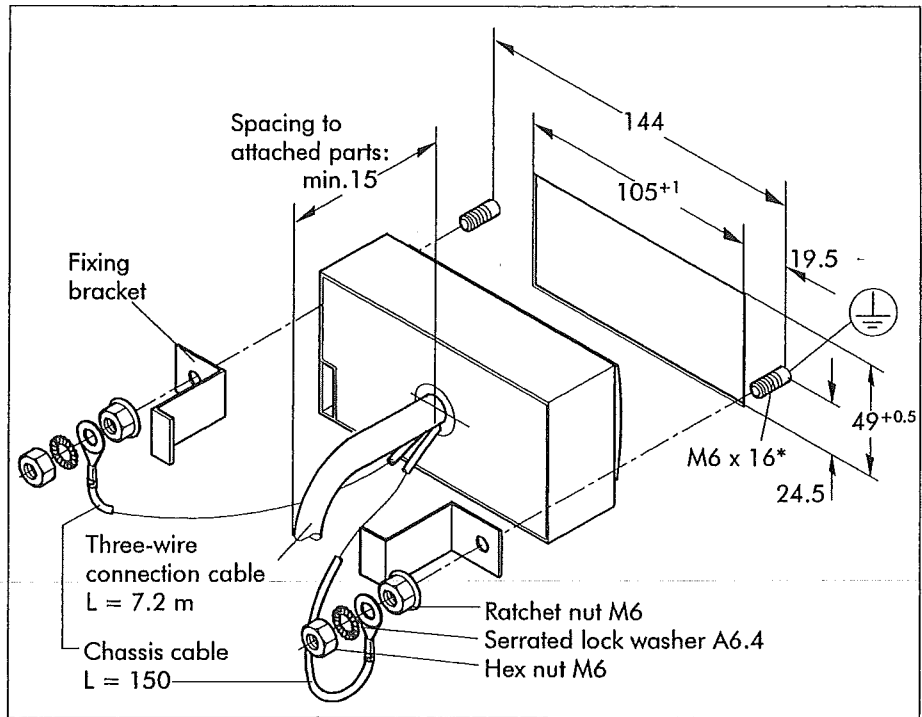
⚠ No torque may be applied to the nuts potted on the rear side.

■ The black potting material must not be exposed to any pressure.

Fitting in the front cover

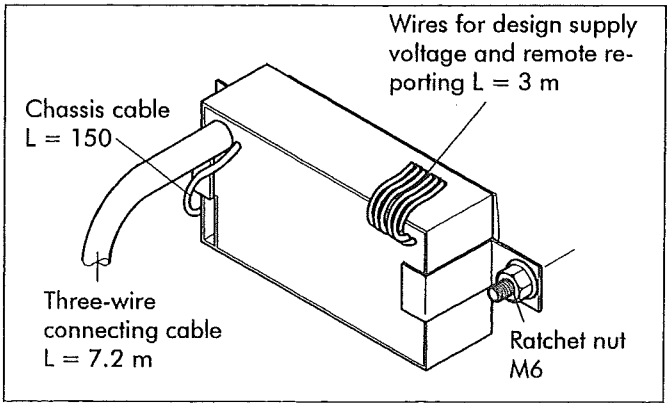
In this case the IVIS display is permanently connected to the front cover. The spacing to attached parts behind the permanently mounted IVIS display must be at least 15 mm (path of the three-wire connection cable).

7
Fitting IVIS display



* Welded bolt or comparable screw connection

8
IVIS-F display



3 Electrical connection

Connection conditions for IVIS display


Two grey single-wire cables must be connected to the switchgear earth for the IVIS display without remote reporting contact.

A grey single-wire cable must be connected to the switchgear earth for the IVIS display with remote reporting contact.

Laying the connection cable (from IVIS display to IVIS coupler) in the longitudinal and transverse posts, on the clad partitions, etc., fixed by means of self-adherent plates (70 x 29) and cable binders.

Additional connection conditions for remote reporting contacts (colour coded)

Design supply voltage:
24 V DC (+ 15% / - 15%)
Maximum power consumption:
60 mA
Red wire: positive
Brown wire: chassis

 For the IVIS-F (with remote reporting) the chassis of the design supply voltage (brown wire) must be short-circuited with the switchgear earth.

If this effect not desired, electrical isolation must be provided for the design supply voltage.

Remote reporting contacts

Violet/pink wire:
Make contact for voltage status, contact closes on dead condition.

Orange/yellow wire:
Make contact for system test, contact closes when the system operates properly.

Service data of the remote reporting contacts

Rated power (resistive):
5 A 250 V AC / 30 V DC

Max. switching capacity:
1250 VA / 150 W

Max. switching voltage:
250 V AC / 125 V DC

Voltage transformer for design supply voltage

If the design supply voltage deviates from 24 V DC, voltage transformers with electrical isolation are supplied.

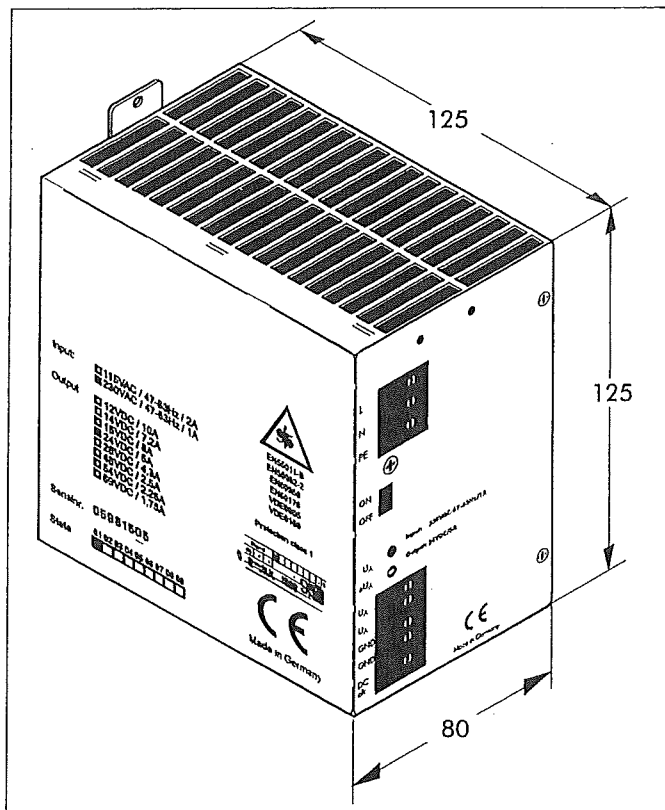
Input voltage ranges:
48 to 230 V DC
230 V AC
Output voltage:
24 V DC

One voltage transformer can supply maximum 50 IVIS displays with remote reporting contacts.

Mounting in the low-voltage cabinet by snap action on top hat rail (DIN EN 50022-35).

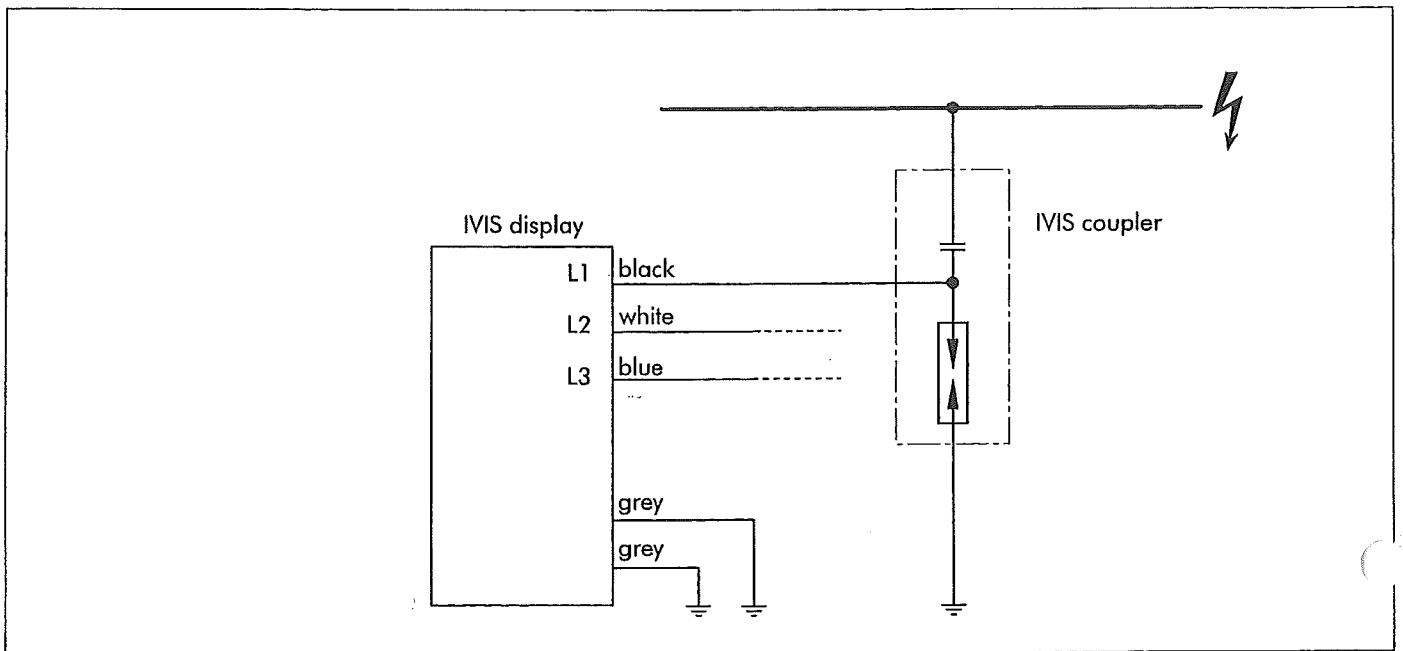
Weight

850 g

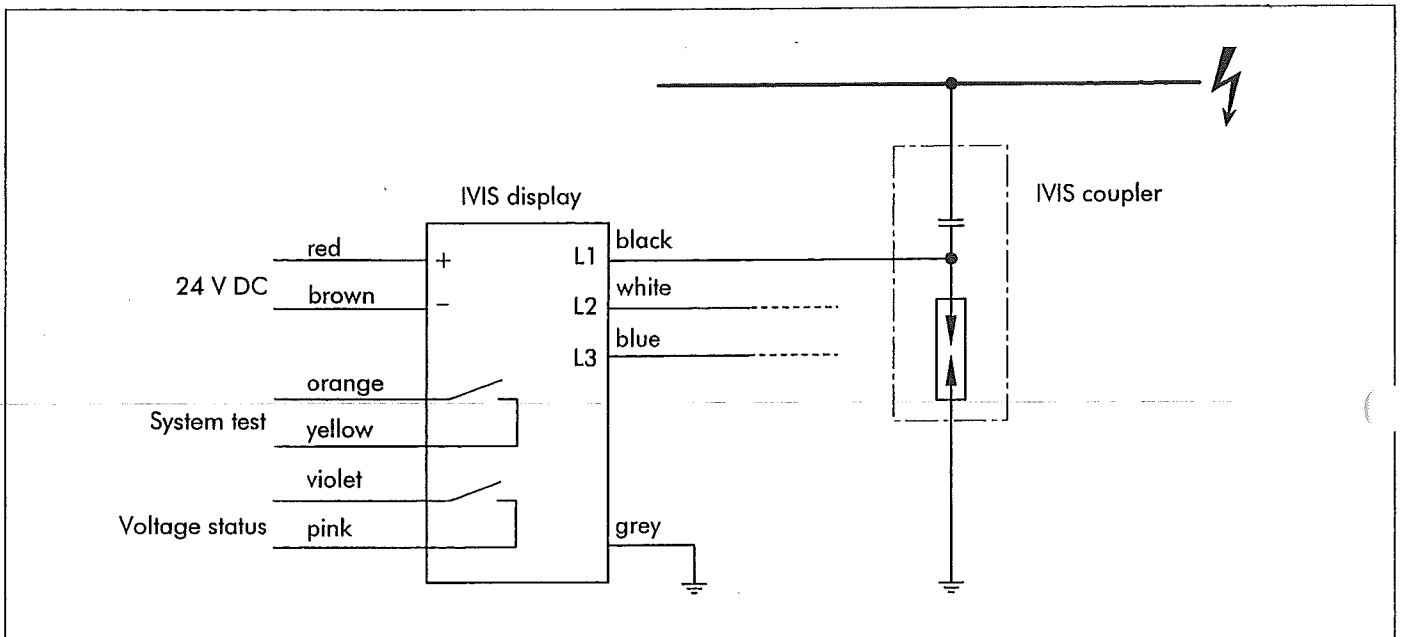


9
Voltage trans-
former for design
supply voltage,
dimensions

4 Circuit diagrams



10
IVIS without remote reporting



11
IVIS-F with remote reporting

5 IVIS components

Designation		Quantity per panel and item number of IVIS components at operating voltage [kV]				
		4 – 5	6 – 7.5	10 – 13.8	15 – 17.5	20 – 24
IVIS coupler		3 x C65 352	3 x C65 352	3 x C65 352	3 x C65 352	3 x C65 353
IVIS coupler, mounting kit		1 x Y80 003				
IVIS display	without remote reporting contact	1 x C26 302	1 x C26 304	1 x C26 310	1 x C26 318	1 x C26 318
	with remote reporting contact	1 x Y80 002	1 x Y80 014	1 x Y80 010	1 x Y80 018	1 x Y80 018
IVIS display, mounting kit		1 x Y80 005				

Designation		Item number of IVIS components (quantity on request)
Voltage transformer for design supply voltage (for IVIS-F only)	48 V DC	065 696
	60 V DC	
	110 V DC	065 697
	125 V DC	
	230 V DC	069 698
	230 V AC	065 699
Operating Instructions	German	531 750
	English	531 751

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