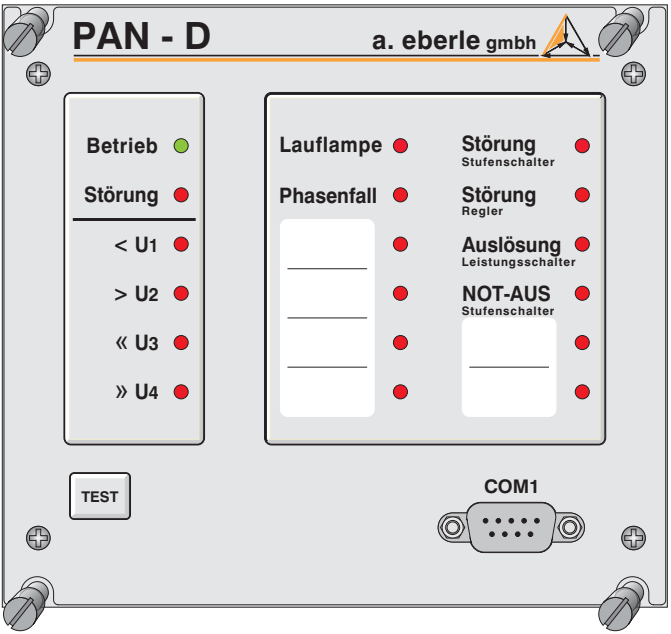
Supervisory Unit PAN - D

Operating manual

Version
21.01.2004/94a

Software-Version



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Supervisory Unit PAN - D

Operating manual
Version 21.01.2004

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1 Warnings and Notes

The supervisory unit PAN - D is exclusively designed for application in installations and equipment of the electrical engineering in which only trained experts are permitted to do all required works. Experts are persons who are familiar with the installation, mounting, putting into operation and the operation of products of this kind. Furthermore experts have qualifications which comply with their field of work.

The supervisory unit PAN - D has been built and tested in accordance with all important electrical safety regulations and left the factory in perfect condition. To maintain this condition and to guarantee safe operation, the following instructions and warnings in this Operating Manual must be observed.

- ❑ The supervisory unit PAN - D has been built in compliance with IEC 10110/EN61010 (DIN VDE 0411), accuracy class I and checked on this norm before delivery.
- ❑ The supervisory unit PAN - D may only been operated with a connected non-fused earthed conductor. This condition is complied with the connection to an auxiliary voltage line net with a non-fused earthed conductor (European net). Should the auxiliary voltage line net have no non-fused earthed conductor, it is absolutely necessary to make an additional connection from the earth-conducting terminal to the earth.
- ❑ The upper limit of the admissible auxiliary voltage U_{AUX} must not be exceeded neither permanently nor for a short while.
- ❑ Before changing the fuses separate the supervisory unit PAN - D completely from the auxiliary voltage U_{AUX}.
  Any use of other fuses than those being of the given type and current intensity is prohibited.
- ❑ A supervisory unit PAN - D which shows a visible damage or a clear malfunction must not be used and has to be secured against unintentional on-switching.
- ❑ Maintenance and repair works which are made when the lines of the supervisory unit PAN - D are laid bare may only be made by authorized experts.

2 Application

An additional supervision of the function of the voltage regulator REG-D and of the function of the tap-changer through the separated autonomous supervisory unit PAN - D increases the safety of the voltage regulation because all setting commands of the regulator are made by contacts of the supervisory unit PAN - D (UND-link, setting command blocking) and because these setting commands will only be passed on to the tap-changer if the switching status are in strict conformance with each other.

In addition to that, the three phase voltages of the net are controlled at the input of the supervisory unit PAN - D and a message will be given if there is a voltage drop.

The supervisory unit PAN - D may be firmly assigned to a regulator REG - D and linked to the regulator by bus (E-LAN) or it may work completely independent from the regulator REG - D.

For additional user-specific controls, supervisions and messages, binary signals may be edited by means of an LED or contact. The operation guide (background program!) of the transformer may thus be made clearer.

3 Delivery Contents

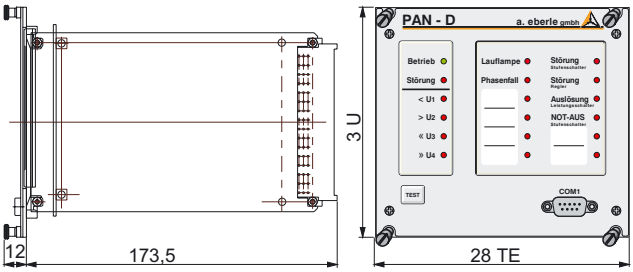
1 piece supervisory unit PAN - D

1 piece operation manual in English

4 Technical Data

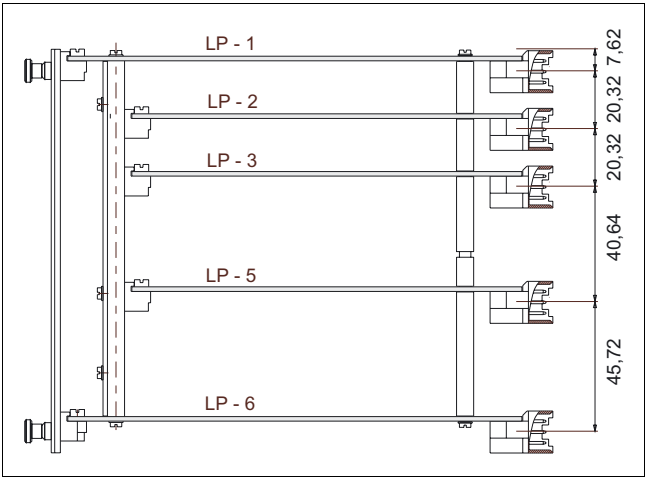
4.1 Plug-in group

front plate	plastic, RAL 7035 light-grey
height	3 U (128.5 mm)
width	28 T (142.2 mm)
weight	≤ 1.5 kgs
protection class	
plug-in group	IP 00
terminal block	IP 00
mounting	acc. to DIN 41494 part 5
plug-in connectors	DIN 41612

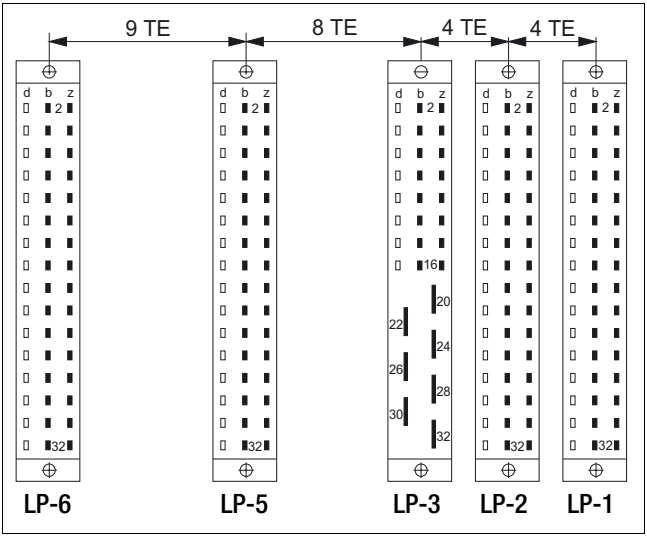


Dimensions

Position of the Pin-Edge Connectors



Position of the Terminal Blocks

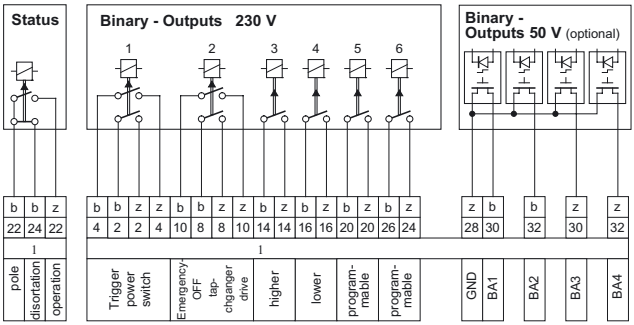


4.2 Contact assignment

4.2.1 Terminal Block 1; (Binary Outputs BA)

Terminal Block 1
(Binary Outputs BA)

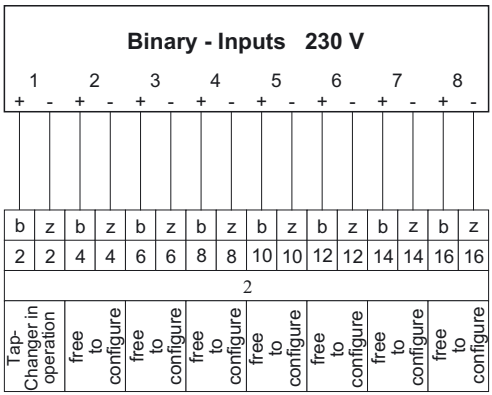
Function	Assign.	Pin	Assign.	Pin
Trigger power switch (2 contact pairs) 2 close	pole	b2	close	z2
	pole	b4	close	z4
Emergency-OFF tap-changer (2 contact pairs) 2 close	pole	b8	close	z8
	pole	b10	close	z10
Higher	pole	b14	close	z14
Lower	pole	b16	close	z16
Programmable	pole	b20	close	z20
Operation / Distortion Turn	pole	b22		
	distortion	b24	operation	z22
Programmable	pole	b26	close	z24
Programmable Binary outputs (BA) 4-semiconductor-relay	poleBA1..4	z28		
	open BA1	b30	open BA3	z30
	open BA2	b32	open BA4	z32



Terminal Block 2
(Binary Inputs BE)

4.2.2 Terminal Block 2; (Binary Inputs BE)

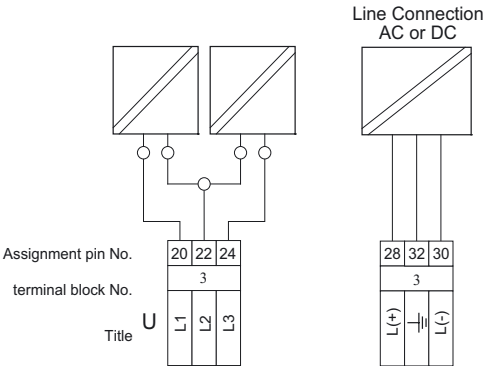
Function	Assign.	Pin	Assign.	Pin
Tap-changer in operation	+	b2	-	z2
Free to configure	+	b4	-	z4
Free to configure	+	b6	-	z6
Free to configure	+	b8	-	z8
Free to configure	+	b10	-	z10
Free to configure	+	b12	-	z12
Free to configure	+	b14	-	z14
Free to configure	+	b16	-	z16



4.2.3 Terminal Block 3; (Measuring Voltage, Auxiliary Voltage)

Terminal Block 3 (Measuring Voltage, Auxiliary Voltage)

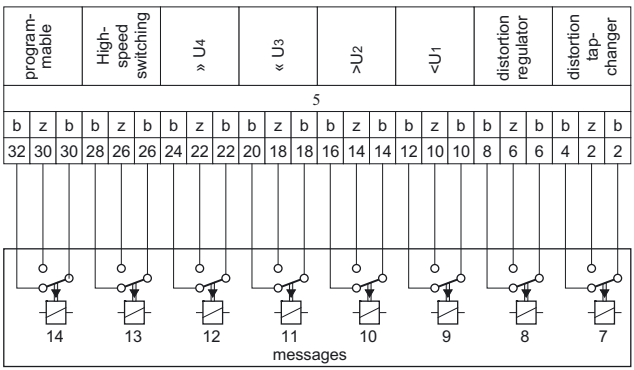
Function	Assign.	Pin
Measuring Voltage U_E	L1	20
	L2	22
	L3	24
Auxiliary Voltage (AC/DC) U_{AUX}	L (+)	28
	N (-)	30
	Earth	32



Terminal Block 5 (Messages)

4.2.4 Terminal Block 5; (Messages)

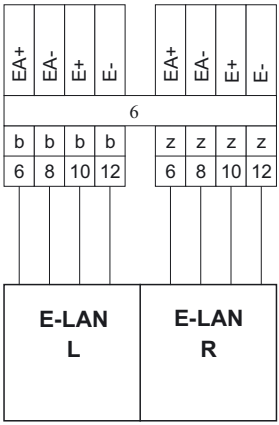
Function	Assign.	Pin	Assign.	Pin
Distortion tap-changer	pole	b2	Close	z2
			Open	b4
Distortion regulator	pole	b6	Close	z6
			Open	b8
< U1	pole	b10	Close	z10
			Open	b12
> U2	pole	b14	Close	z14
			Open	b16
<< U3	pole	b18	Close	z18
			Open	b20
>> U4	pole	b22	Close	z22
			Open	b24
High-speed switching	pole	b26	Close	z26
			Open	b28
programmable	pole	b30	Close	z30
			Open	b32



4.2.5 Terminal Block 6; (E-LAN)

Terminal Block 6 (E-LAN)

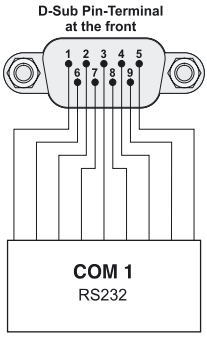
Function	Assign.	Pin	Assign.	Pin
E-LAN	left EA +	b6	right EA +	z6
	left EA -	b8	right EA -	z8
	left E +	b10	right E +	z10
	left E -	b12	right E -	z12



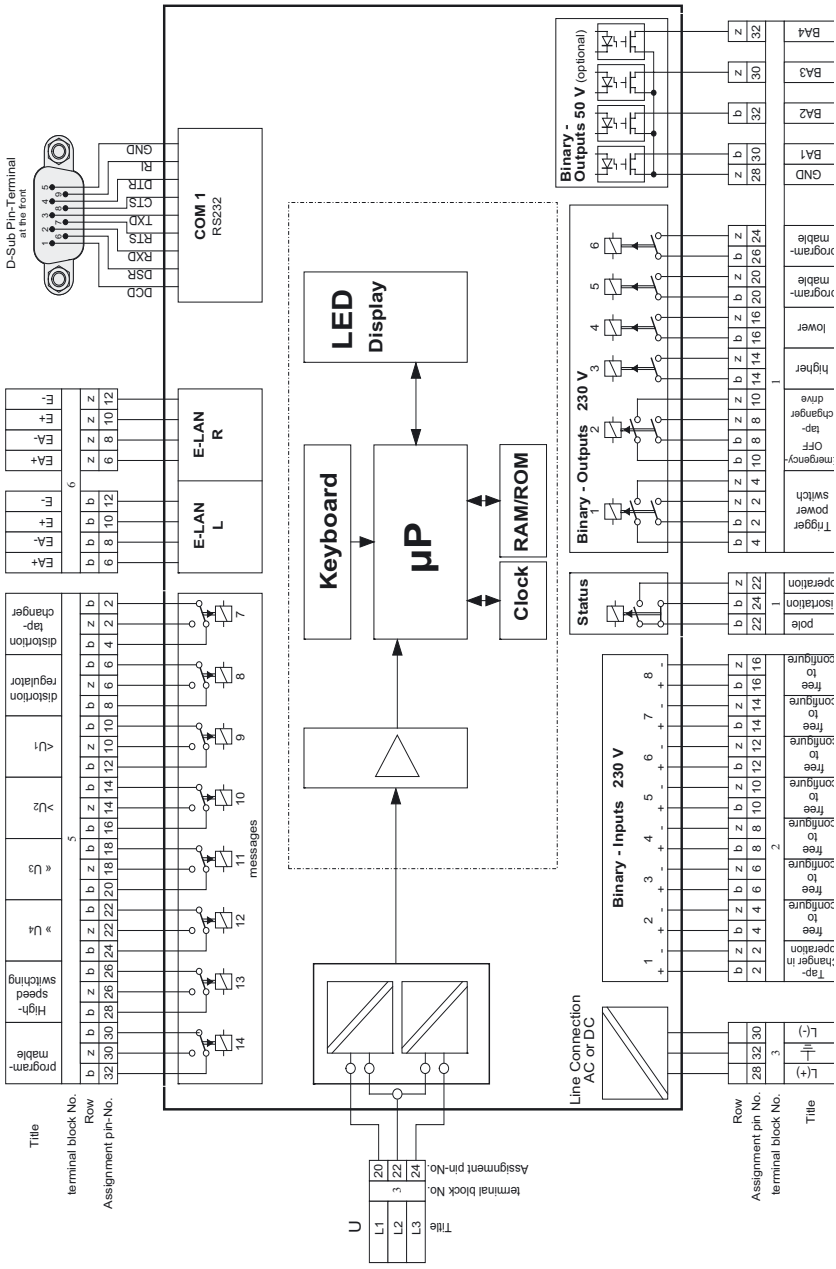
Interface COM 1

4.2.6 Interface COM 1

Function	Pin
DCD	1
RXD	2
TXD	3
DTR	4
Signal Ground	5
DSR	6
RTS	7
CTS	8
RI	9



4.2.7 Pin assignment of the terminal blocks



4.3 Rack Mounting

Caution!
Plug-in-rack must be grounded!

Each plug-in rack is provided with space for 84 units and thus for 84 place numbers „n“. Each single place number is the point of reference for the mounting of the aligning plugs and the connection elements at the back of the rack.

Place numbers

Terminal block	1	2	3	4	5	6
Screws	n	n+4	n+8	n+11	n+16	n+25
aligning plugs	n	-	-	-	-	n+26

4.4 Wall Mounting rack, type 30 TE

How to mount PAN - D

The supervisory unit PAN - D is, after the transparent cover has been opened, put into the case and fixed by the four screws on its front plate.

To wire the supervisory unit PAN - D, the light-grey part of the surface mounting case may be opened to the left or to the right. To do this, please unfasten the corresponding grub screw and pull out the hinge pin.

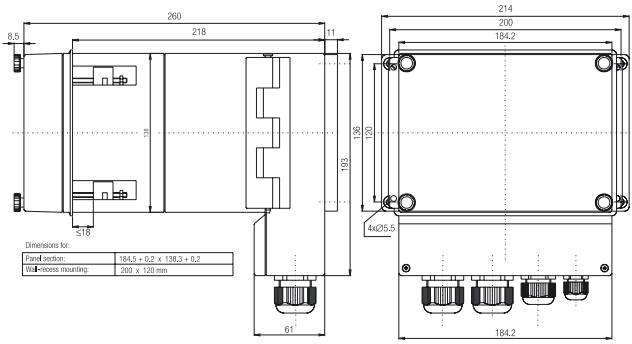
Dimensions of the wall mounting rack

Material	plastic, RAL 7035 light-grey
Height	193 mm
Width	214 mm
Weight	< 1.5 kg
Protection Class	IP 00
Mounting Location	any
Connection Terminals	AMP connectors

Hole distance for the wall-mounting

Width: 200 mm

Height: 120 mm



4.5 Wall rack, type 30 TE for panel mounting

Mounting assistance

- ➪ Mark mounting location of the guide rail in screw-hole rail clearly
- ➪ Carefully bring out the guide rails by means of a srewdriver
- ➪ Untighten and remove all 4 screws at the outer edges
- ➪ Pull off upper case part with cover
- ➪ Remove ground line
- ➪ Let upper case part slide through the panel section
- ➪ Turn all 4 laterally fixed claws by 90°
- ➪ Clamp the upper case part with the corresponding 4 screws from the front into the panel board
- ➪ Reconnect ground line of the case from the back
- ➪ Push lower case part onto upper case part

- Fix both case parts with the 4 screws at the outer edges (slot-screw at the left, screw-part with internal thread at the right)
- Mount guide rails

Dimensions for the panel section

Width:	184.5 + 0.2 mm
Height:	138.3 + 0.2 mm

4.6 Parameterization, Configuration of the PAN-D

4.6.1 With REG-D

If the supervisory unit PAN - D is to be operated by the keybord and the LC-display of the regulator REG - D, it will be necessary to link PAN - D and REG - D by system bus (E-LAN). Normally, a two-wire twisted line is sufficient.

Due to the fact that the supervisory unit PAN - D is always assigned to a certain regulator, this link restricts the permissiveness of the bus assignment, which had been valid for the total system before this link.

Link PAN - D to REG - D

Connection of the link line

The link line must be connected from the right bus terminal (terminal block 6, connection z6, z8) of the supervisory unit PAN - D to the left bus terminal of the regulator (terminal block 6, connection z6, z8).

Note

On the 2-wire-connection between REG - D and PAN - D, there must not be any further connections of regulators or supervising units.

Therefore both interfaces must be operated isolatedly, e.g. the matching resistors for the interfaces must be switched to position 'ISOLATION terminated' in both instruments (see E-LAN, operating manual REG - D).

4.6.2 With PC

If the supervisory unit PAN - D works completely independently from the regulator REG - D, the configurating and parameterizing software WinREG may be used to parameterize by PC (interface COM 1 of the PAN - D).

How to put into operation

The supervisory unit PAN - D will be ready for operation if the auxiliary voltage UAUX (=UH) is available. The readiness for operation is indicated through the illumination of the LED 'OPERATION'.

Giving of the address

After the putting into operation, the regulator gives the PAN - D address automatically. To do this, the regulator increases its own address by 1 and passes this new address on to the supervisory unit PAN - D.

Example

Address of the regulator: A ➜ Address PAN - D: A1
Address of the regulator: C9 ➜ Address PAN - D: D

How to exchange the data

Without any further steps, PAN - D communicates with the regulator (taking from the regulator: present setpoint value, transmission ratio Knu of the voltage transformer, tap-change position and operation mode HAND / AUTOMATION) - provided that no other E-LAN participant at the E-LAN has this address.

A flashing of the LED 'OPERATION' in the regulator indicates colliding addresses. In this case of a collision of addresses, the interrupting E-LAN participant must be set to another address.

After having settled the collision, the flashing may be continued for a maximum of 20 s.

5 Description

5.1 Interface COM 1

The serial interface COM 1 is at the front of the supervisory unit PAN - D and offers the possibility of coupling a PC, a terminal or a modem.

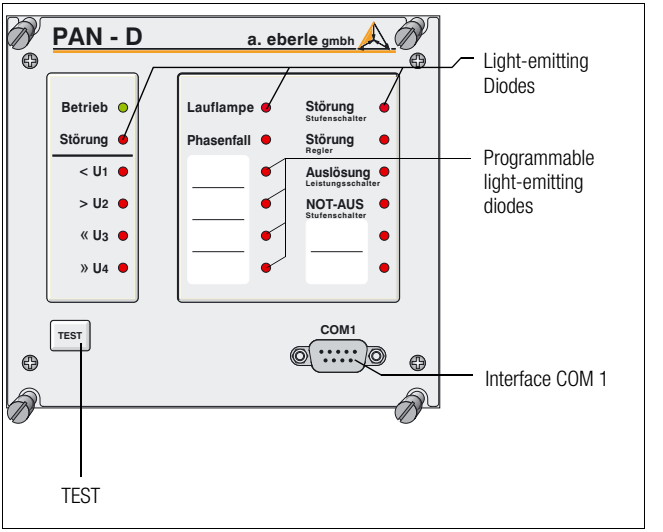
For technical data and pin assignment please page 16

5.2 E-LAN (Energy-Local Area Network)

Please refer to the operating manual of REG - D

6 Operation

6.1 Indication and Operation Elements

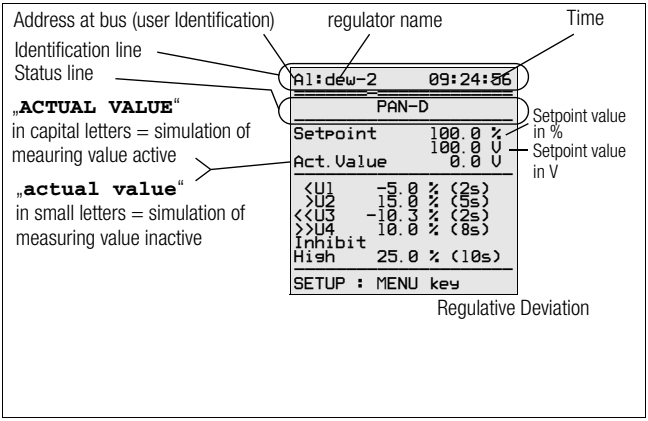


TEST

Test

For lamp and CPU-Test (see “Lamp Check / CPU - Test” on page 35), For starting the prime load (see page 58) and For acknowledging messages (see page 31 and page 32).

LC-Display of the voltage regulator REG - D



7 Supervisory Functions

7.1 Supervision of the PAN-D (Self-surveillance)

Operation (green)	
Flashes	No communication with the corresponding regulator possible or collision of addresses
Illuminates	Operation without disturbances Exception: Illuminates with operating prime load and flashes when receiving data
OFF	Internal disturbances

Disturbance (red)	
Flashes	---
Illuminates	Internal disturbances
OFF	Operation without disturbances Exception: Illuminates with operating prime load

7.2 Supervision of the line voltage

Phase fall (red)	
Flashes	---
Illuminates	After 2 s time delay, if, in three-phase measuring, not all phase voltages (L1, L2, L3) are available at the input of the PAN - D Precondition: Switch 'Measuring 3-phase' (Functions-1) selected
OFF	In three-phase measuring, all three phases are available

< U1 (red); limit value transmitter < U 1 undervoltage setting range: 0.75 X_0 ≤ G1 ≤ 1.00 X_0 (X_0: reference quantity for the limit value) when undershoot U < G1	
Flashes	---
Illuminates	The limit value is **undershot** and the time delay has expired.The setting commands LOWER (R4) are blocked; At the same time relay R13 (high-speed switching) is activated.
OFF	Actual value > U1

Note

The necessary wiring from the regulator to the supervisory unit has to be made by the user.
If needed, the limit value may be laid to a binary output (R5,R6,R14 or BA1 ... BA 4).

> U2 (red); limit value transmitter < U 2 overvoltage setting range: 1.00 X_0 ≤ G2 ≤ 1.25 X_0 (X_0: reference quantity for the limit value) when undershoot U > G2	
Flashes	---
Illuminates	The limit value is **overshot** and the time delay has expired.The setting commands HIGHER (R3) are blocked; At the same time relay R13 (high-speed switching) is activated.
OFF	Actual value < U2

Note

The necessary wiring from the regulator to the supervisory unit has to be made by the user.
If needed, the limit value may be laid to a binary output (R5,R6,R14 or BA1 ... BA 4).

<< U3 (red); limit value transmitter << U 3 undervoltage setting range: 0.65 X_0 < G3 < 1.00 X_0 (X_0: reference quantity for the limit value) when undershoot U << G3	
Flashes	---
Illuminates	The limit value is **undershot** and the time delay has expired. At the same time, the LED 'Disturbance regulator' is illuminated. The supervisory unit PAN - D edits the message 'DISTURBANCE regulator' (R8). The limit signal may be laid to a binary output (R5, R6, R14 or BA1 ... BA 4).
OFF	Actual value > U3

>> U4 (red); limit value transmitter >> U 4 overvoltage setting range: 1.00 X_0 < G4 < 1.35 X_0 (X_0: reference quantity for the limit value) when undershoot U >> G4	
Flashes	---
Illuminates	The limit value is **overshot** and the time delay has expired. At the same time, the LED 'Disturbance regulator' is illuminated. The supervisory unit PAN - D edits the message 'DISTURBANCE regulator' (R8). The limit signal may be laid to a binary output (R5, R6, R14 or BA1 ... BA 4).
OFF	Actual value < U4

Trigger power switch (red); limit value transmitter 'trigger' setting range: 1.00 X_0 < G5 < 1.35 X_0 (X_0: reference quantity for the limit value) when undershoot U > G5	
Flashes	---
Illuminates	The limit value is exceeded and the time delay has expired. If required, the limit signal may be laid to a binary output (R5,R6,R14 or BA1 ... BA 4).
OFF	Power switch operations in perfect condition

Notes to limit value transmitter

Time delay

The temporal difference between the reaching of the limit value and the signal edit is defined as time delay. For each limit value transmitter, there may be the selection (parameterization) of its own time delay.

Switching hysteresis, switching difference Xsd

The difference of the input quantity between the switching on and off of the limit signal after the limit value reaching has disappeared, is defined as switching difference. The switching difference Xsd has a unified value of 1 % of 100 V (which corresponds to 1 V).

Setting the limit values/Plausibility check

In each limit value transmitter, the limit value may be set at any requirement within a given range. Therefore, the user must check the logical references of the values between themselves.

Reference quantity X_0 and reference value for the limit values

The upper and the lower limit value may be fixed as a relative value in % of the reference quantity ΔU [%] or as an absolute value in ΔU [V] in reference to the nominal value of the voltage U_{nom}.

Example relative limits

If the reference quantity „setpoint value XR“ is selected, all limit values will change relatively to the corresponding setpoint value.

Setpoint value: X_R = 102.0 V; Limit values: ±10 %;

Therefore the upper limit is 112.2 V or the lower limit 91.8 V.

Example absolute limits

Provided that the reference quantity „U_{nom} = 100 V“ is selected, the limit values refer to the nominal voltage of 100 V and are thus independent from the present setpoint value.

Reference quantity: U_{nom} = 100 V; Setpoint value: 105 V;

Limit values: ±10 % of U_{nom};
thus the upper limit is 90 V or the lower limit 110 V.

7.3 Supervision of the tap-changer

Tap-changer in operation (red)	
Flashes	---
Illuminates	Signal available at binary input 1 (TAP-CHANGER IN OPERATION)
OFF	Unswitched or no signal at binary input 1 (TAP-CHANGER IN OPERATION)

Disturbance Tap-changer (red)	
Flashes	---
Illuminates	TAP-CHANGER IN OPERATION-error
OFF	Tap-changer operates in perfect condition

Emergency OFF Tap-changer (red)	
Flashes	---
Illuminates	**Up to software version 1.74** TAP-CHANGER IN OPERATION-error Or Grading in the wrong direction **From software version 1.75** on Running time of the motor drive longer than the set time (SETUP 3 'Functions') and the limits <U1 or >U2 are undershot respectively exceeded
OFF	Tap-changer operates in perfect condition

Note

The LED indicates the error status as described, relay R2, however, starts up for 3 s on appearing of the error but then drops again (impulse relay function).

Acknowledgement of messages

LED „OFF“

- ➪ from change of operation mode HAND to operation mode AUTOMATION
- ➪ when striking key „TEST/RESET“

7.4 Supervision of the regulator REG - D

Disturbance regulator (red)

Note
The regulator is only controlled in operation mode AUTOMATION

Flashes	---
Illuminates	Limit value reaching of << U3 or >> U4
OFF	When bringing the regulator to a standstill or when the voltage is within the limits of <<U3, >>U4

Acknowledgement of messages
LED „OFF“

- from change of operation mode HAND to operation mode AUTOMATION
- when striking key „TEST/RESET“

Programmable message boxes with LEDs
The programmable message boxes display free programmable events (see “LED Assignments” on page 54).

Function keys (F1 ... F5) on REG - D
To select the device function and to parameterize the supervisory unit PAN - D.

Auto
Supervisory functions of the PAN - D run automatically with set parameters.

Hand (Manual operation)

To parameterize the PAN - D. No other changes are accepted than changes made in operation mode „HAND (MANUAL OPERATION)" .

ESC (Abort)

To return from the „**SETUP**"-menus.

Arrow keys

To increment or decrement the simulated measuring values during the integral measuring value simulation (see operating manual REG - D).

MENU

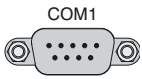
To switch to the different indication modes and to the „**SETUP**"-menus of the voltage regulator REG - D and to the supervisory unit PAN - D.

Return

To confirm a changed parameter in the „**SETUP**"-menu points (see page 45). Changes of parameters are not valid before being confirmed by „Return".

Serial interface COM1

To link the voltage regulator to external devices



7.5 Operation Principle

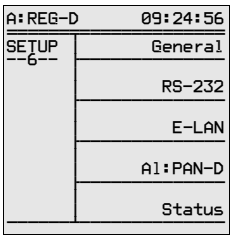
The operation of the supervisory unit PAN - D is made by means of the voltage regulator REG-D, is totally menu-guided and, as a rule, the same for each menu-point of „**SETUP**“.

Should parameters be set or changed, please apply to the following operation scheme:

- „HAND (MANUAL OPERATION)“ changes to manual operation
- „MENU“ poll the list of operation modes
- „MENU“ select menu point „**SETUP**“
- „MENU“ may be used to turn the pages of the menu selection „**SETUP**“ until the required parameter appears on the display.
- Select parameter by corresponding function key („F1“ ... „F5“).
- Set value of the parameter by the function keys.
  - „F1“ increments the value in large steps
  - „F2“ increments the value in small steps
  - „F4“ decrements the value in small steps
  - „F5“ decrements the value in large steps
- „F3“ is reserved for special functions in some „**SETUP**“ menus.
- If the insertion of a value is finished, the changed value will have to be confirmed by „RETURN“ .
- Insert password (see “Password” on page 38).
- Return or leave the „**SETUP**“ menus by „ESC (ABORT)“
- Menus „**SETUP**“ will automatically be left if no key is pressed down for approx. 15 seconds.
- If the required parameters are typed in, checked and each one confirmed by „RETURN“ the regulator REG-D will be in a position to return to operation mode „AUTO“ .

7.6 Selection of the indication mode

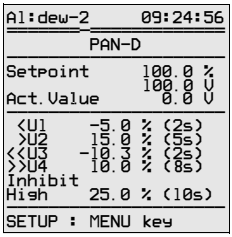
After striking key „MENU" MENU several times, the indication modes of the supervisory unit PAN - D may be selected in the **SETUP** menu 6 of the voltage regulator REG-D.



Note

If parameters of the PAN - D are monitored, then there is a short line continuously displayed within the upper double lines on the display.
This is to show that the bus link between REG - D and PAN - D is in perfect condition.
After approx. 5 minutes the display will automatically switch back to the voltage regulator REG - D.

The display shows the set setpoint value, the present actual value as well as the set limit values.



Note

If the display monitors the term „**Actual Value**" as „**ACTUAL VALUE**" in capital letters, the „MEASURING VALUE SIMULATION" will be online.
Please see operation manual of REG-D.

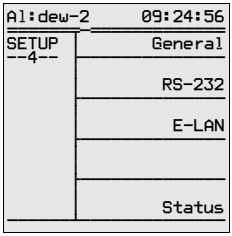
➪ „MENU" MENU selects the „**SETUP**" menu 1 of supervisory unit PAN - D

Setup-menus

7.7 Lamp Check / CPU - Test

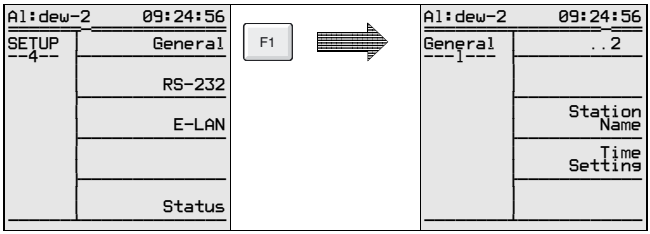
➪ To check the functions of the light-emitting diodes on the front-panel and the CPU, please strike key „TEST" TEST .

8 Basic Settings

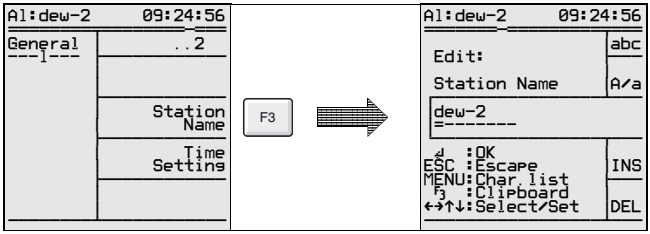


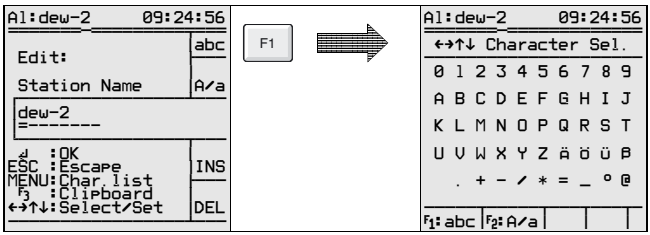
In „**SETUP**-menu 4“ all basic settings may be defined and modified.

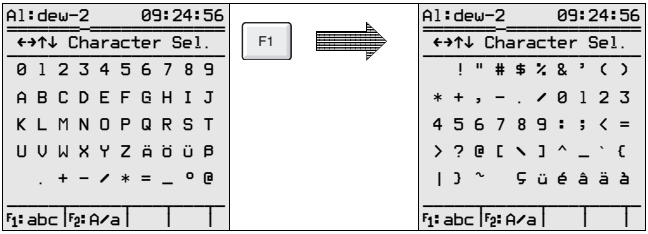
8.1 General

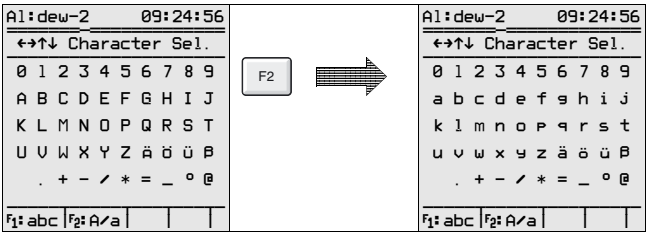


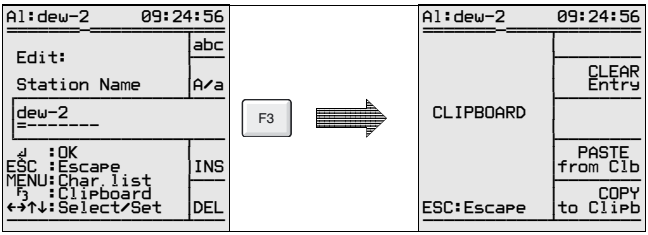
8.1.1 Identification Signal (User ID)



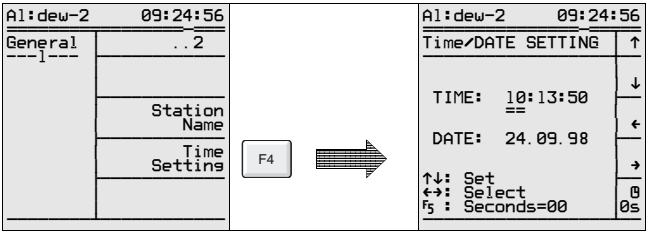




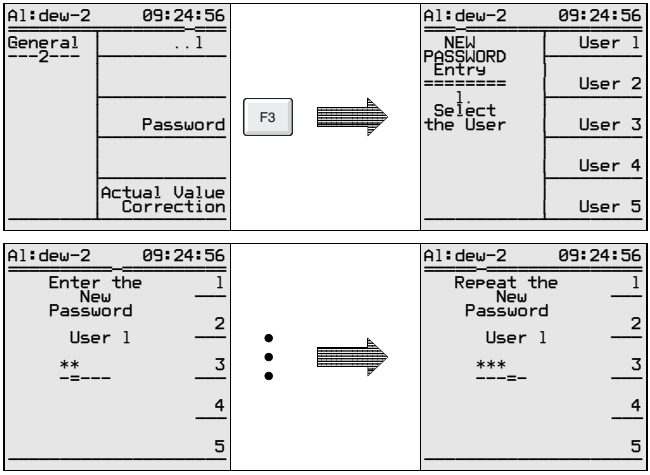




8.1.2 Set Time/Date



8.1.3 Password



Note

User 1 may change all passwords whereas every other user is only able to change his own password!

Delete Passwords

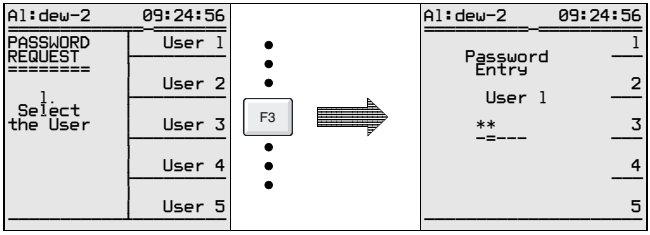
Insert „111111“.

The deletion of the password will only be possible if user 1 has 'opened' the device with his password!

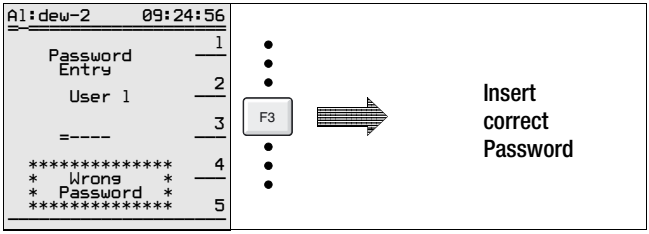
Note

When user 1 deletes a password, he switches the complete password poll off (even for the other users!).
User 2 to 5 only delete each corresponding password

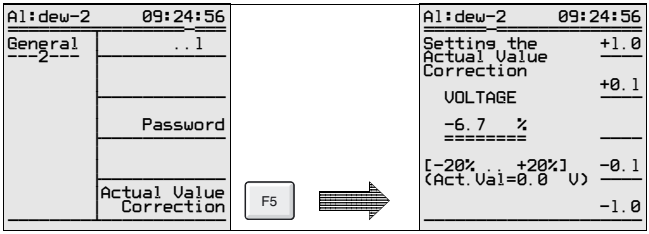
Poll Password



Wrong Password

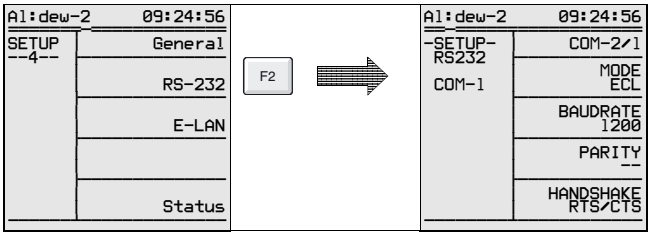


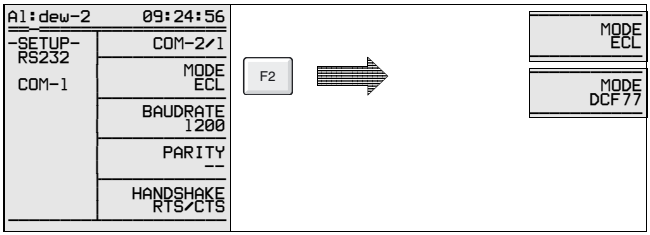
8.1.4 Actual Value Correction of Measuring Voltage U_E

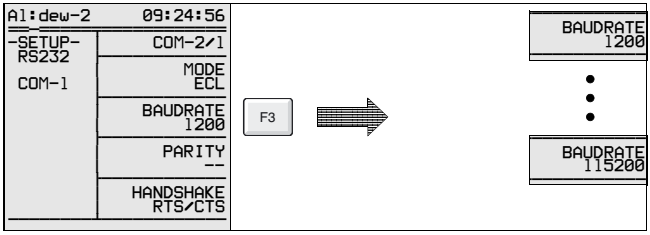


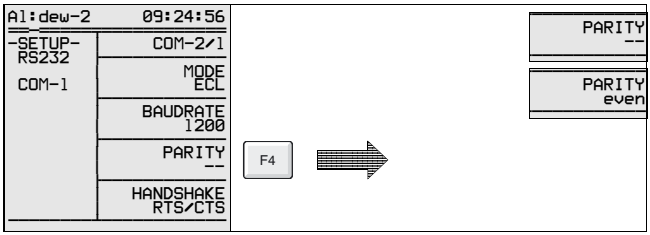
8.2 RS-232 Interfaces

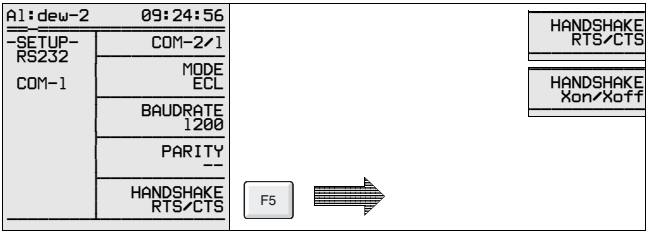
8.2.1 Interface COM 1



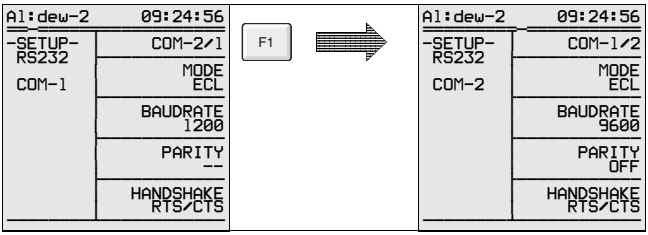


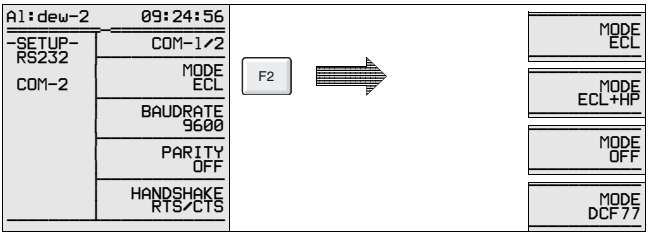


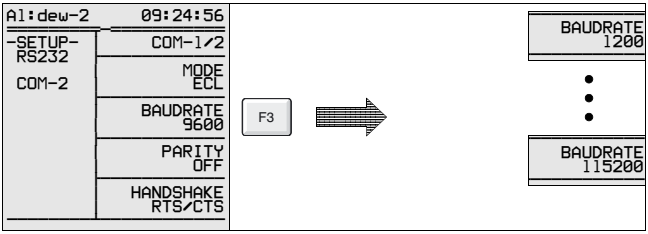


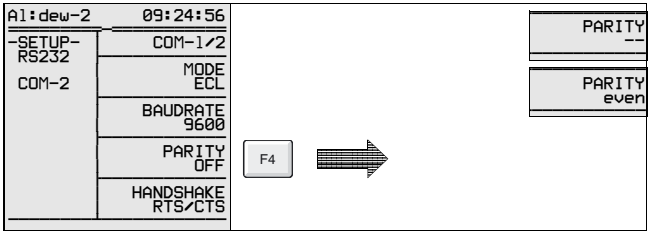


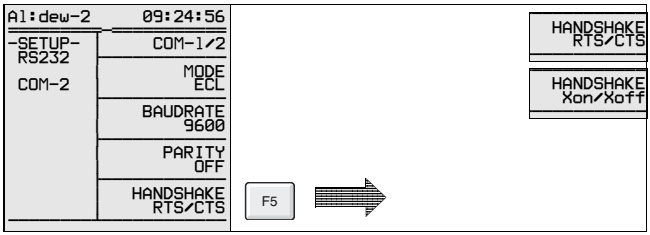
8.2.2 Interface COM 2



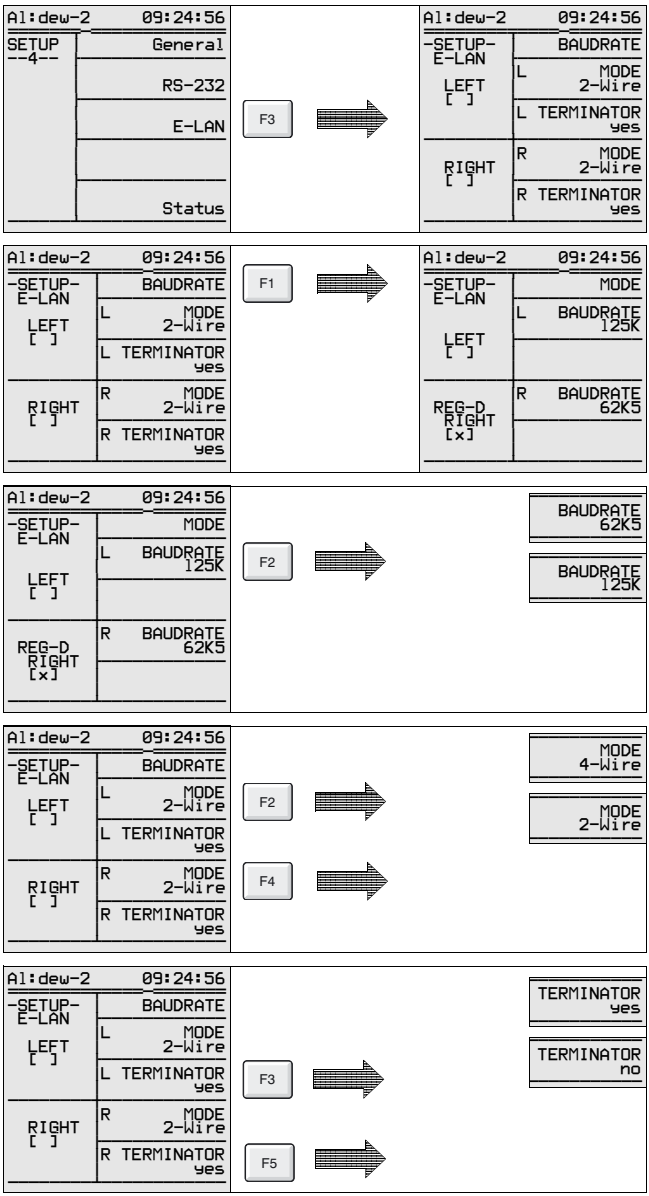




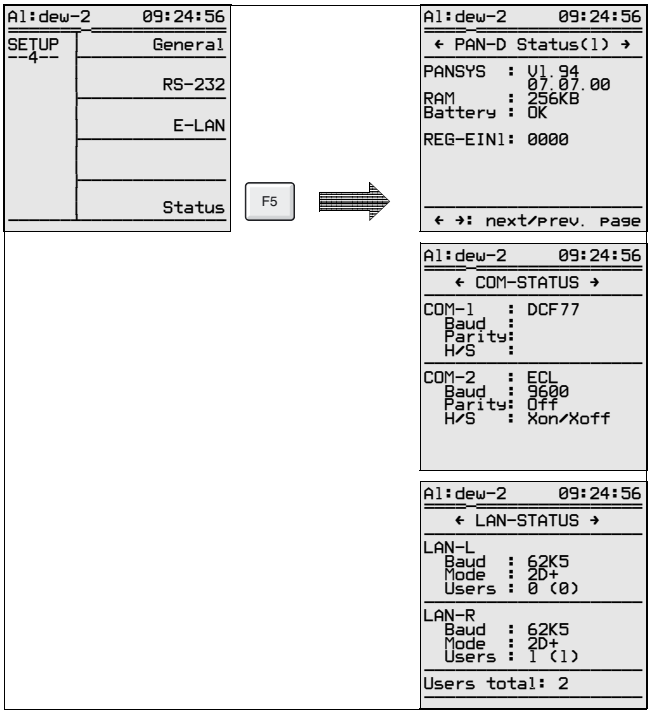

Al:dew-2
09:24:56
-SETUP-
RS232
COM-2
COM-1/2
MODE
ECL
BAUDRATE
9600
PARITY
OFF
HANDSHAKE
RTS/CTS
F4
PARITY
--
PARITY
even


Al:dew-2
09:24:56
-SETUP-
RS232
COM-2
COM-1/2
MODE
ECL
BAUDRATE
9600
PARITY
OFF
HANDSHAKE
RTS/CTS
F5
HANDSHAKE
RTS/CTS
HANDSHAKE
Xon/Xoff

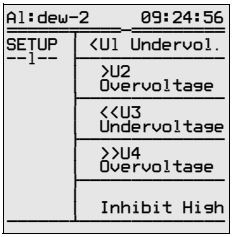
8.3 E-LAN (Energy-Local Area Network)



8.4 Status (present data of the supervisory unit PAN - D)



9 Parameterization of the supervisory unit PAN - D



➪ To be able to give parameters, please set regulator REG-D to operation mode „HAND“.

Note

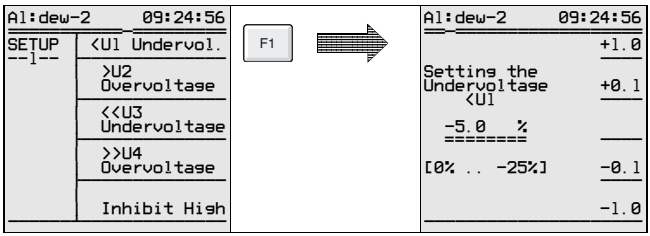
Changes in the parameters are not accepted before having switched to operation mode „HAND (MANUAL OPERATION)“

Furthermore, when password poll is activated, a valid password must be inserted (see “Poll Password” on page 38).

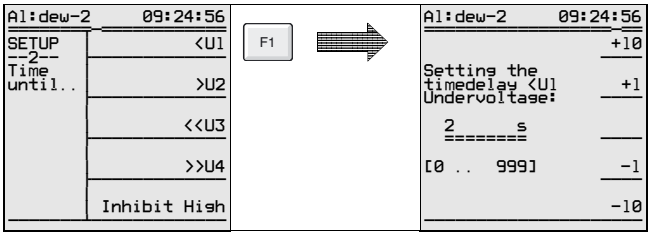
When setting the limit values >U2 and >>U4, please consider that, in case of a current-depending setpoint value increase in voltage regulator REG-D, the actual setpoint value may deviate from the set setpoint value

For operation principle see page 34.

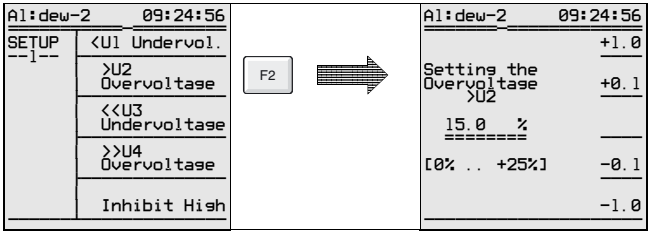
9.1 < U1 Undervoltage



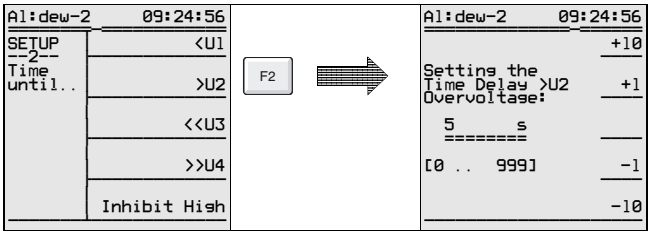
9.2 Time Delay < U1 Undervoltage



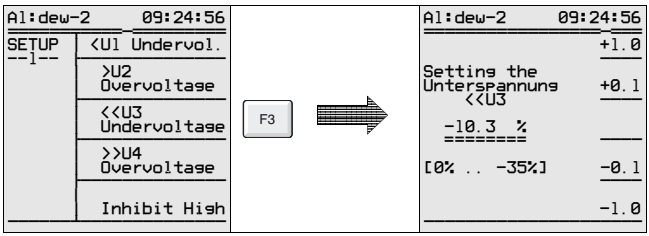
9.3 > U2 Overvoltage



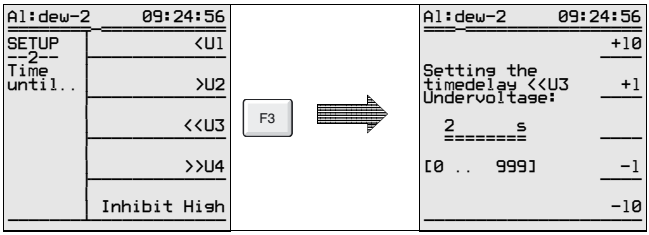
9.4 Time Delay < U2 Overvoltage



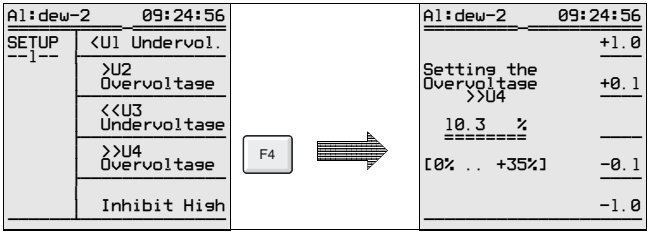
9.5 << U3 Undervoltage



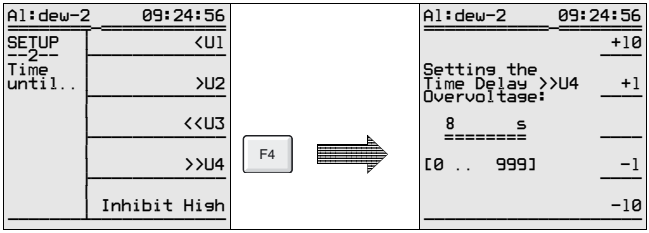
9.6 Time Delay << U3 Undervoltage



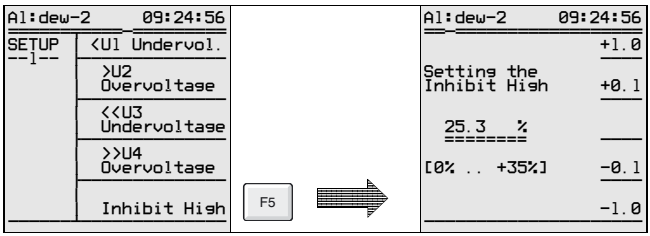
9.7 >> U4 Overvoltage



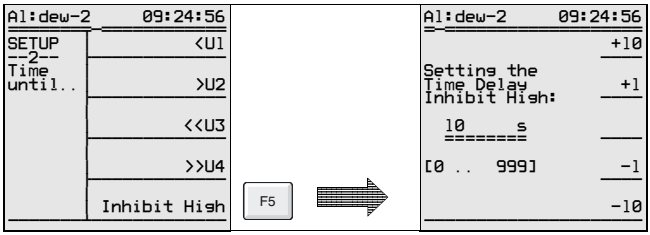
9.8 Time Delay >> U4 Overvoltage



9.9 Trigger

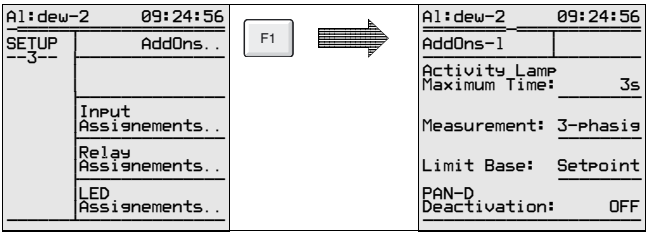


9.10 Time Delay Trigger

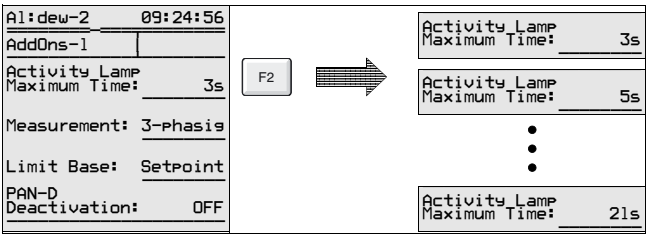


9.11 Functions

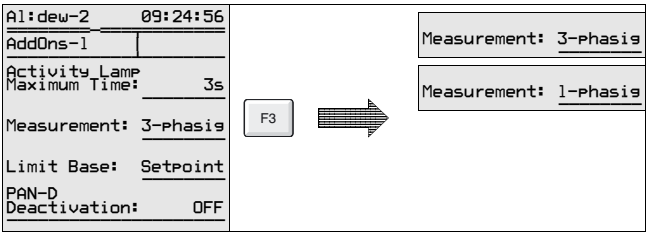
The title „functions“ in SETUP 3 defines all features and additional functions which may be activated or deactivated or also offer completing features.



9.11.1 Maximum Time of Tap-changer in operation



9.11.2 Measuring (of the net voltage)



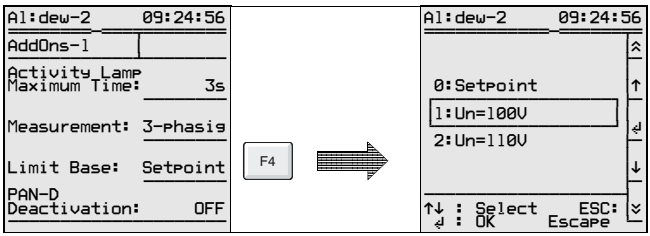
9.11.3 Limit Value Reference (Reference quantity)

The parameter limit value reference offers the possibility to send the message to the regulating system if the limit values are to be set relatively to the correspondingly active setpoint value or relatively to the nominal voltage U_{nom} = 100 V.

If the parameter „Setpoint value“ is selected and the limit <U1 is set for example to – 10 %, then, the limit value switch <U1 will react as soon as the voltage drops by more than 10 % below the active setpoint value.

If the parameter 'Unom' is selected, the limit value switch <U1 will trigger at a voltage lower than 90 V ($\hat{=}$ –10 %) regardless to the active setpoint value.

The statements for <U1 apply by analogy for all PAN-D limits which are inserted in %.



9.11.4 PAN - D Deactivation

The function 'PAN - D deactivation' is an assisting function for the putting into operation of the regulating system.

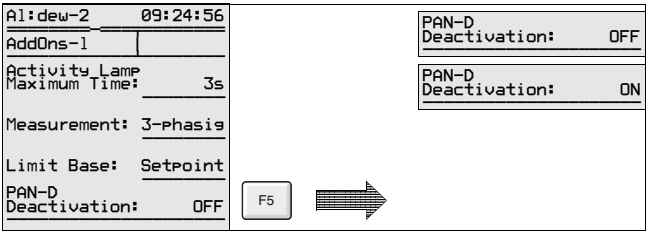
During the putting into operation, it is occasionally necessary to drive the transformer over the complete tap-change range by hand.

Should PAN-D be activated, there would only be the possibility to change the voltage within the limits <U1 and >U2.

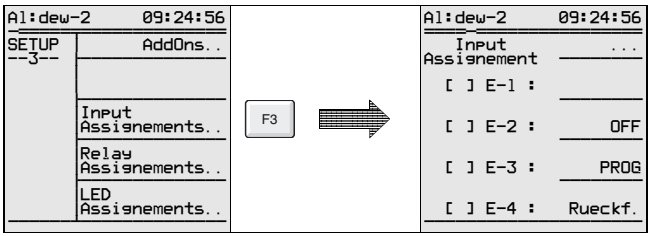
Should the voltage exceed oder undershoot one of these two values, PAN-D would block all further setting commands to the tap-changer.

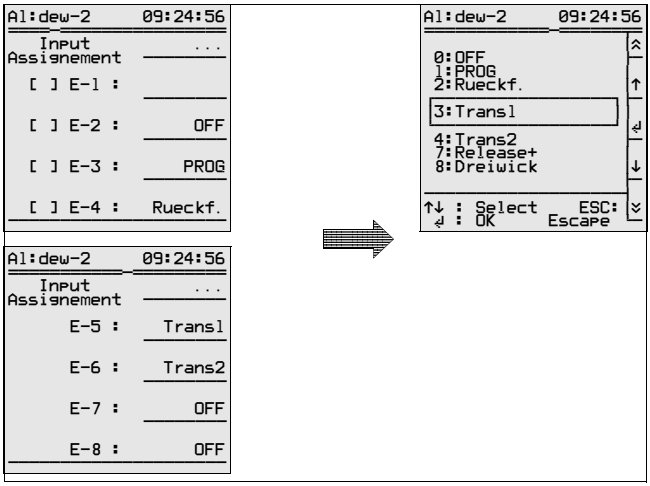
The function „PAN - D deactivation“ which may only be switched on in operation mode HAND suppresses as well this blocking as also the reactions on the limits <<U3 and >>U4.

If the regulator is reset to operation mode AUTOMATION, the deactivation will automatically be deleted.

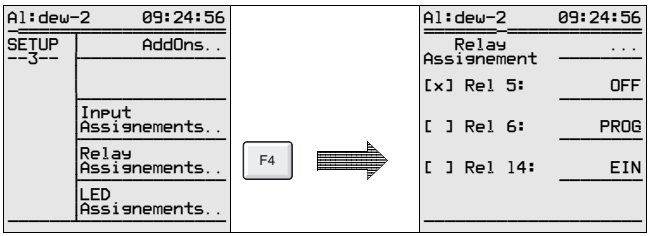


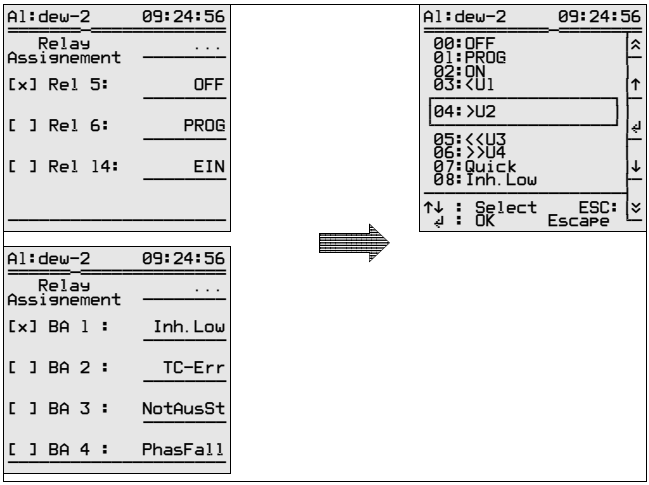
9.12 Input Assignments (Binary Inputs)



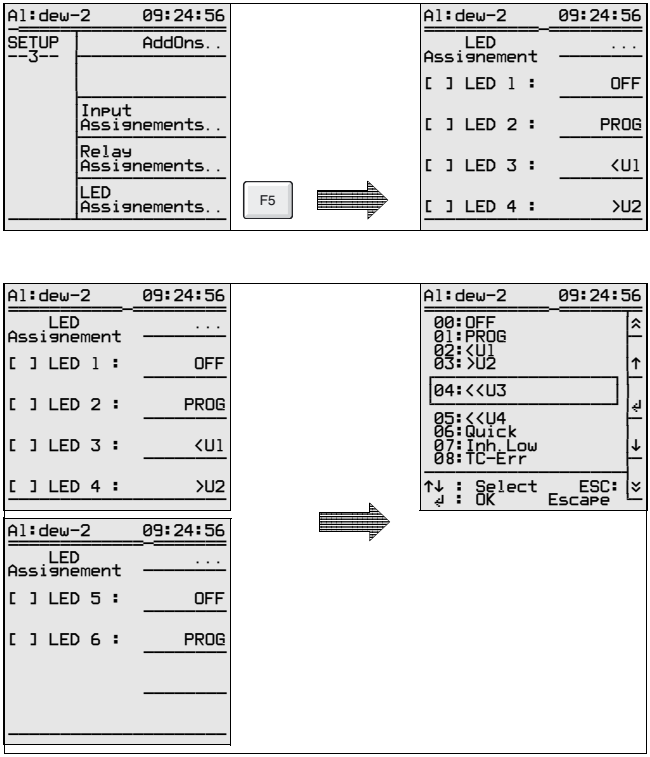


9.13 Relay Assignments



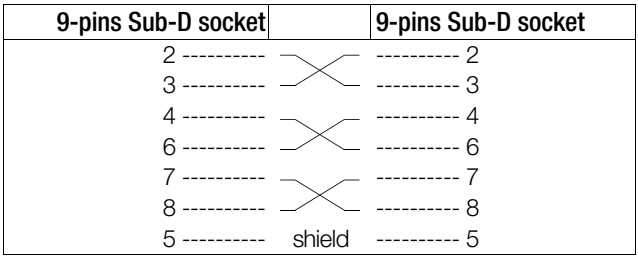


9.14 LED Assignments



10 Update of the Operation Software

To update the operational software, it is necessary to use a Zero modem cable. Due to the high baudrate, however, a hardware Handshake is also required. Therefore the RTS/CTS lines must be linked crosswise.

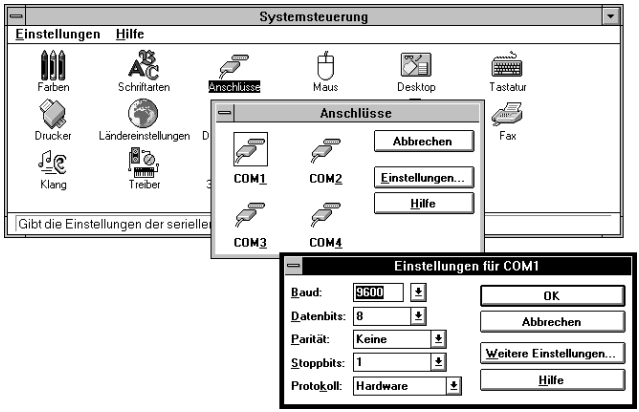


10.1 Preparing the PC

10.1.1 Operation System Windows 3.x

- Open window „Control Panel“
- Open window „Connections“
- Open window „Settings for COM1 and COM2“
- Select features

Baud (baudrate):	9600 or 38400 or 115200
Data bits:	8
Parity:	none
Stop bits:	1
Protocol:	hardware

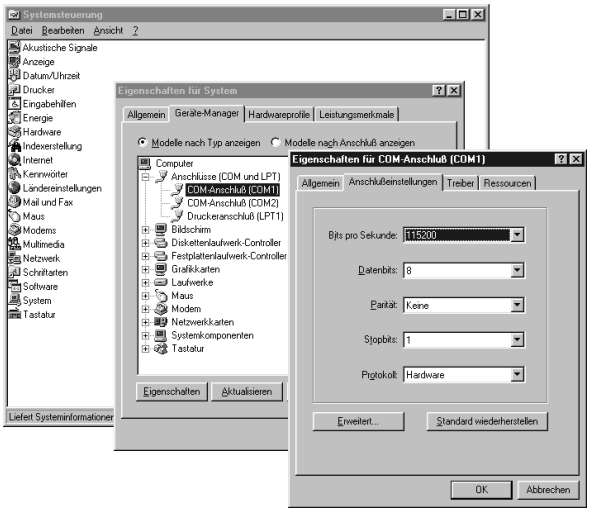


- Close window by „OK“
- Connect cable of the PC to the selected interface COM1 or COM2
- Connect cable of the interface COM1 to the supervisory unit PAN-D
- Continue with „Start Prime Load“, as shown „Start Prime Load” on page 58

10.1.2 Operation System Windows 95/98

- Open window „Control Panel“
- Select „Systems“
- Select „Device Manager“
- Select COM-connection (COM1) or (COM2)
- Select characteristics
- Select „Connection Settings“
- Select features

Bits/seconds (Baudrate):	9600 or 38400 or 115200
Data bits:	8
Parity:	none
Stop bits:	1
Protocol:	hardware



- Close all windows by „OK“
- Connect cable of the PC to the selected interface COM1 or COM2
- Connect cable of the interface COM1 to the supervisory unit PAN-D

10.2 Start Prime Load

In order to make an update of the operation software, the prime load must be started in the supervisory unit PAN-D. To do this, please press down key „TEST" TEST for approx. 5 s.

When the prime load is activated, the LEDs 'OPERATION' and 'DISTURBANCE' are illuminating at the same time. The set baudrate is displayed on the programmable LEDs and may, resp. must be set to the same value as in the PC by pressing down key „TEST" TEST .

- Programmable LED 1:115200 Baud
- Programmable LED 2: 38400 Baud
- Programmable LED 3: 19200 Baud
- Programmable LED 4: 9600 Baud

While the key is being pressed down, all LEDs are illuminating.

If data is received, the OPERATION-LED is flashing; as soon as there is an error, the DISTURBANCE-LED will start flashing. During the transmission, the data receiving may be aborted by key „TEST" TEST (then the DISTURBANCE-LED will consecutively start flashing).

- RESET: If key „TEST" TEST is being pressed down for more than 2 s (in this time all LEDs are illuminating), all LEDs will stop to illuminate. If the key is not pressed down any more, a RESET will be executed.

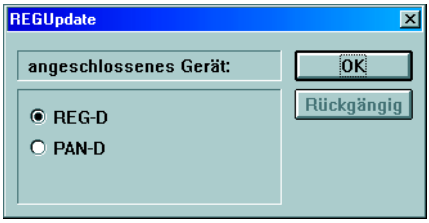
Note

The prime load may be started again if the key „TEST" TEST after having been released will be pressed down again until the prime load is loaded (LEDs OPERATION and DISTURBANCE are illuminating).

- On part of the PC, the download is made by means of the program „update.exe".
  The standard of the baudrate is 115200 Baud.
  Windows 3.xx does not support high baudrates > 57600 Baud. This is why, in this case, the download program automatically sets a baudrate of 57600 Baud.
  Therefore the regulator must be adjusted to the same baudrate in this case.

➪ The download itself is being started by menu point Download\alles Updaten (=Download\update all).

➪ The program automatically recognizes if a REG-D or a PAN-D is connected.
If a recognition is not possible (< prime load version V1.05), the selection will be made by a dialogue.



The further processing runs automatically and at the end of the download is a reset. Then a message box appears which indicates that the instrument is ready to work now.

❑ In case of other messages there would be a disruption and the download would have to be repeated again.

Note

If you may have further questions, please send us an E-mail: „LMeberle@aol.com"

11 Maintenance and Current Consumption

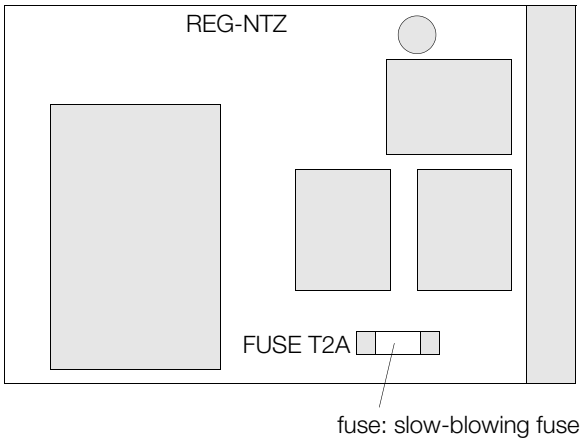
11.1 How to change fuses

Caution!

Before changing fuses, please do separate supervisory unit PAN-D from the power supply!

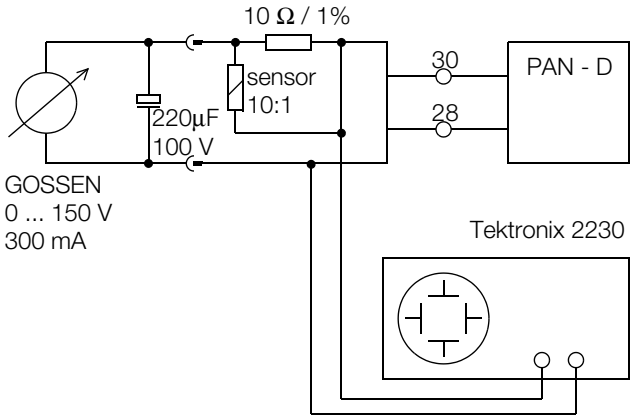
Required fuse: slow-blowing fuse 250 V, 2 A

You find the fuse holder on terminal block 3



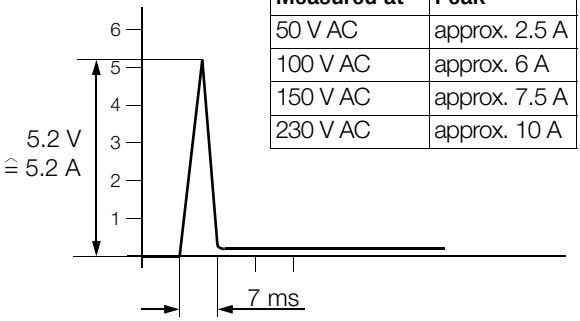
11.2 Current Consumption PAN - D

Measuring circuit (100 V DC)



Measuring results

Power-up spike at 100 V DC



Measured at	Peak
50 V AC	approx. 2.5 A
100 V AC	approx. 6 A
150 V AC	approx. 7.5 A
230 V AC	approx. 10 A

12 Definition of Abbreviations

Please refer to the operating manual of REG - D.

13 Index