

MANUAL

Field Current Regulator

F2.1

UNITEK | Industrie Elektronik
G m b H

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Version
0807

Field current regulator F2.1

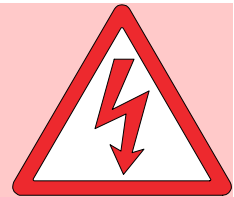
Content:	Page
1 Basic-Information	
Safety Advice	3
Technical Data	5
2 Mechanical Installation	
Dimensions F2-12A	6
Dimensions F2-20A	7
3 Electrical Installation	
Connection Plans - field current regulation	8
4 Adjustment	
Adjustment field current regulator	10
Connection detach switching	11
Adjustment detach switching	12
5 Guarantee	14

1 Basic Informations

Electronic devices always involve the risk of failure.

Caution High Voltage

AC 430V~, DC 560V=



This manual has to be read carefully and must be understood by experts before installing or starting the device.

If there are any doubts call your trader or the manufacturer.

The F2.1 series is designed to regulate electrical currents; protection standard IP00.

Standards and Guidelines:

The device and it's associated components can only be installed and switched on where the local laws and technical standards have been strictly adhered to:

- EU-Guidelines 89/392/EWG, 84/528/EWG, 86/663/EWG, 72/23/EWG
EN60204, EN50178, EN60439-1, EN60146, EN61800-3
- IEC/UL IEC364, IEC 664, UL508C, UL840
- VDE-regulations VDE100, VDE110, VDE160
- TÜV-regulations
- Regulations of Professional and Occupational bodies: VGB4

The user has to assure that: after

- after - a failure of the device
- an incorrect handling
- a failure of the control unit etc.

the drive is brought to a secure operating condition.

Machines and installations are to be provided with supervisory and safety equipment, that is independent of the device.

Adjustment

- only by qualified personnel
- adhere to safety regulations

Installation work

- only when disconnected from all power lines.

QS

The devices are archived by the manufacturer with serial number and their test specifications.

CE

The EU-guide line 89/336/EWG with the Regulations EN61000-2 and EN61000-4 are observed.



Technical Data

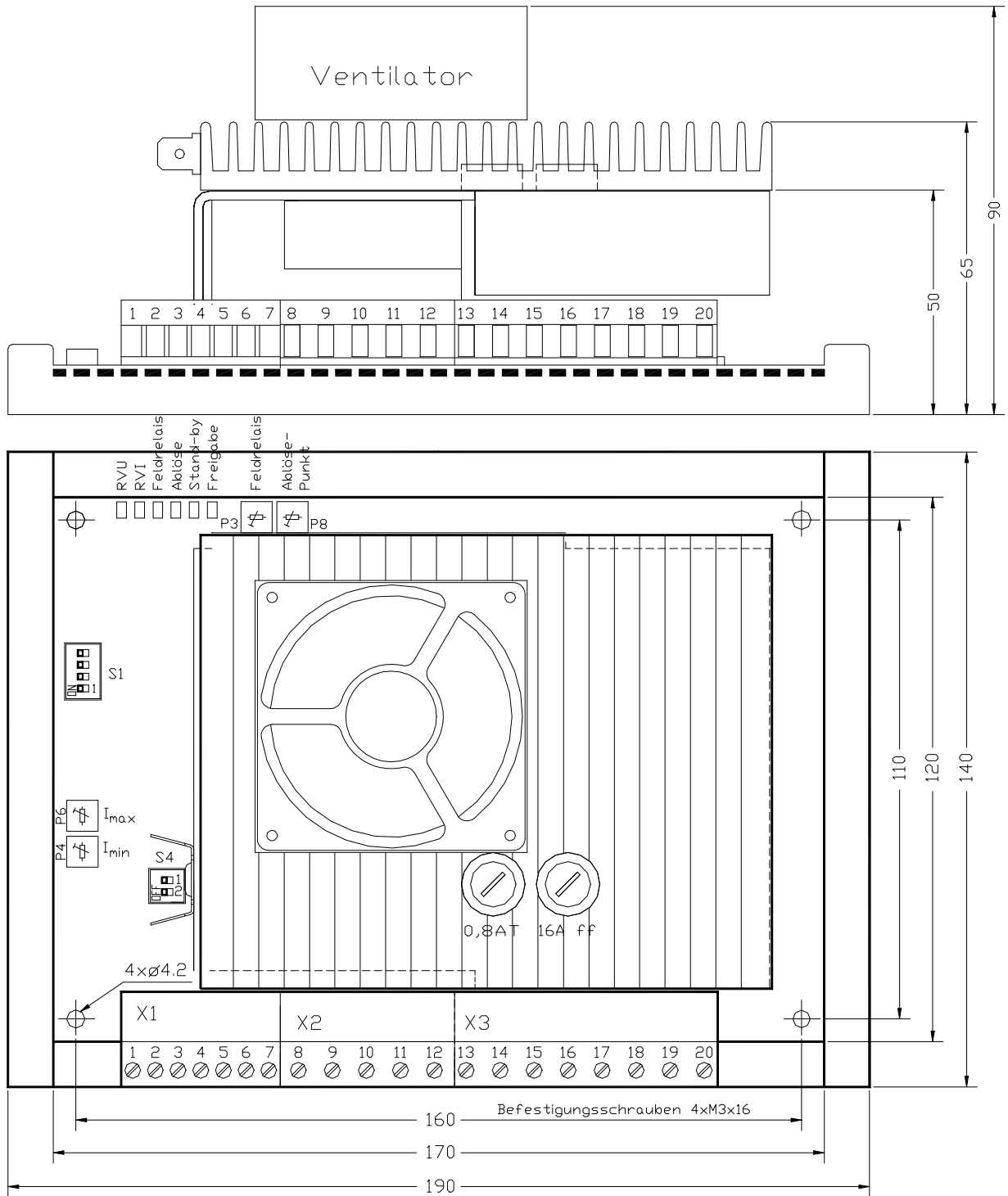
Device Type	F2.1	230/180-12	230/180-20	400/340-12	400/340-20
Power Voltage max.	V~	230	230	400	400
Auxiliary Voltage	V~	230	230	400	400
Output Voltage max.	V=	180	180	340	340
Input Current max.	A~	13,2	22	13,2	22
Output Current max.	A=	12	20	12	20
Fuse protection Auxiliary voltage	AT	0,8			
Absicherung- Power voltage	Aff	Int. 16	Ext. 25	Int. 16	Ext. 25
Dimension	mm	190x140x73	206x160x112	190x140x73	206x160x112
Weight	kg				

Common specifications

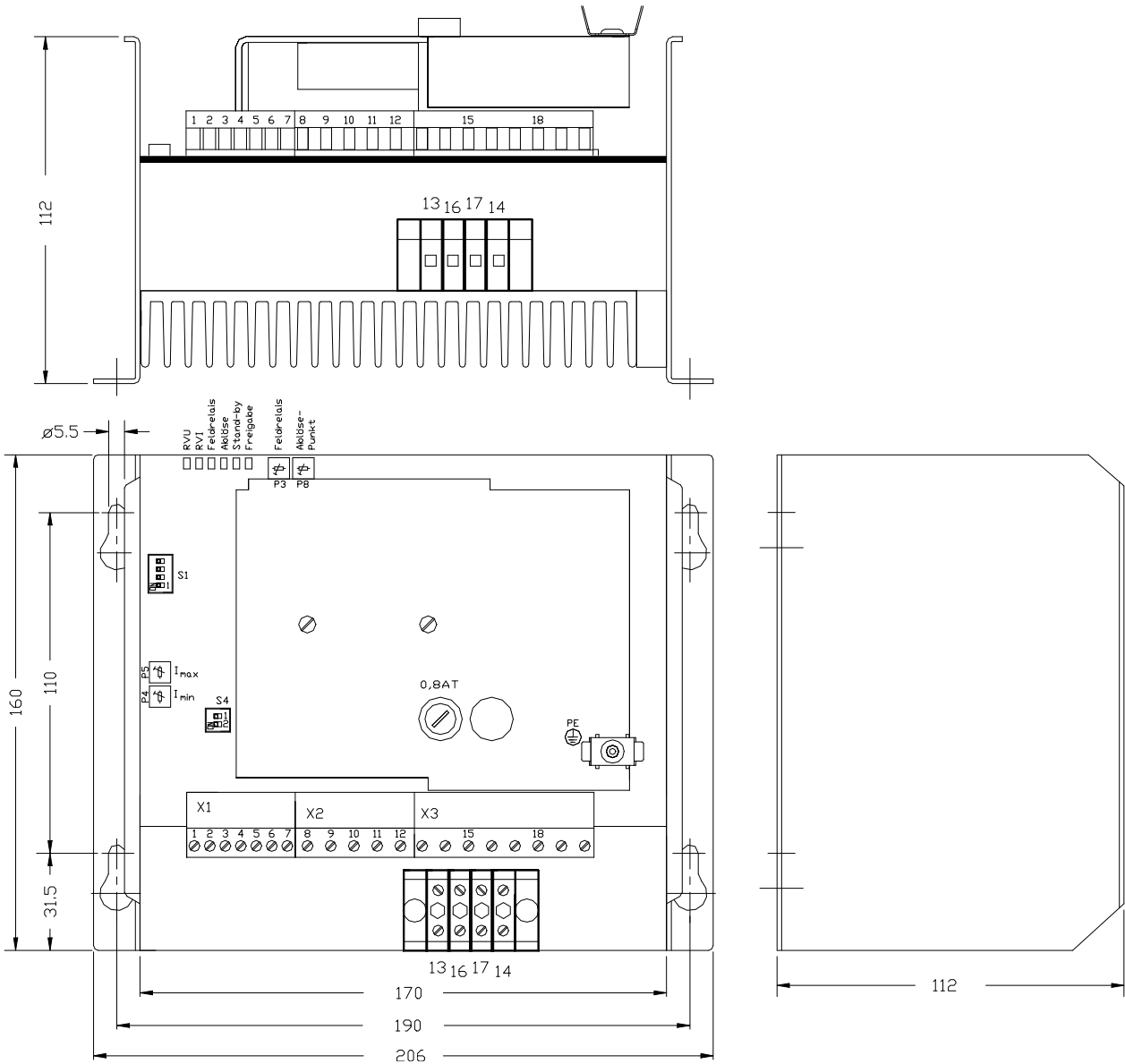
mains frequency	50 or 60 Hz ±5%
protection standard	IP 00
device layout	VDE 0100 group C VDE 0160
humidity stress	class F according to DIN 40040
set up height	< 1000m over NN
operating range	0 ... 45° C
extended operating range	up to 60°C red. 2%/°C
bearing range	-30°C up to +80°C

Field current regulator F2.1

Dimensions F2.1-12A



2 Mechanical Installations



Dimensions F2.1-20A

Field current regulator F2.1

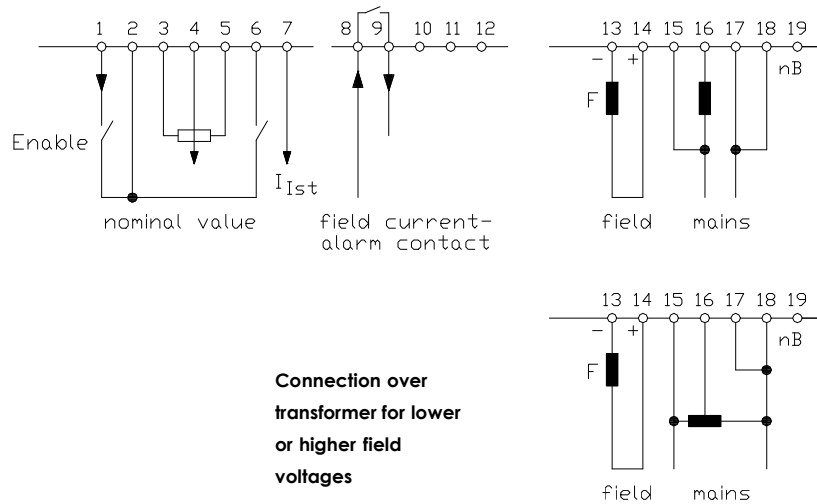
Field current regulation

To use the field current regulation the jumper SW1 must be in position 1-2. The nominal value voltage of 0...12 V corresponds to a field current of 0...12A(20A). With the potentiometer I_{min} the minimum current could be increased to 1A.

Connection diagram

The regulation electronics are galvanic isolated.

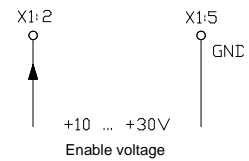
Field regulator



Enable

The field controller is enabled, if the output X1:1 is connected to X1:2 over a relay contact or a switching voltage >10V...30V is applied against X1:5.

The enabling is indicated with LED D13.



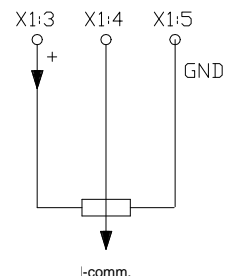
Nominal value

The current nominal value can be adjusted with a potentiometer and internal supply or by applying an external voltage. The resistance of the potentiometer could be 5...10 kΩ, the external voltage not higher than +12V.

A higher voltage is possible, but over 10V there is no increasing of the current.

Nominal value mit potentiometer

The potentiometer is connected to X1:3 (+12) and X1:5 (GND). The centre tap is connected to the nominal value input X1:4. 0...12V nominal value corresponds to 0...12A (20A) field current.



The setting value of X1:4 can be reduced internally with the potentiometer P6 I_{max1} .

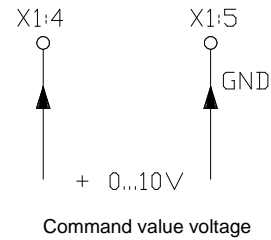
With a fixed setting value X1:3 is connected to X1:4 and the current value is adjusted with potentiometer P6 I_{max1} .

3 Electrical Installations

Nominal value from external

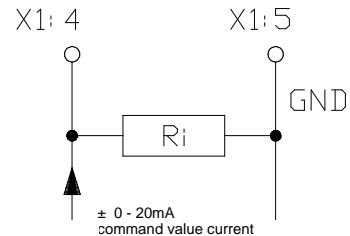
A voltage 0...+12V could be connected to the nominal value input X:4 and the GND X1:5.

Input resistor 57kΩ..



Nominal value current

For the transforming of a nominal value current 0...20A mA a resistor Ri with 600Ω resistance must be connected between X1:4 and X1:5.

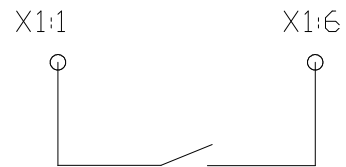


Noninal value reduction

By closing a contact between X1:1 and X1:6 referenced to X1:5 the setted current nominal value can be halved. (Stand - by - switching)

The function is indicated by LED D11.

The minimum field current is not influenced.



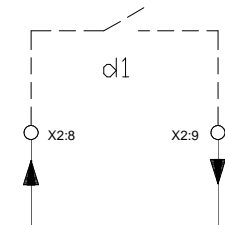
Field current signal

The field current signal can be adjusted between X2:8 and X2:9 for max. 48V/1A.

Field current signal - 0-10A from field current.

The relay d1 operates, when the field current is higher than the adjusted value.

LED D5 emits, if the relay operates.



Field current advice

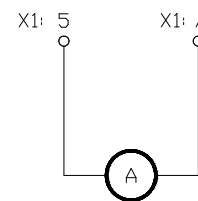
At the output X1:7 a display for the field current can be connected referenced to X1:5.

The measuring value:

2,5V for 12A field current.

4,2V for 20A field current

Output resistor 10kΩ



Current adjustment

The potentiometer P8 is adjusted to clockwise stop.

First max. current then min. current adjust.

Allowed nominal value - can be between X1:3 and X1:4 a bridge

Maximum field current

The potentiometer P4 I_{min} - anti clockwise stop.

By enable and max. nominal value - the potentiometer P6 I_{max} is adjusted:

max. field current minus min. field current

For example:

maximum field current 8A

minimum field current 2A

Potentiometer P6 I_{max} = 6A

Minimum field current

With the potentiometer P4 I_{min} a minimum field current between 0 and 30% from nominal current is adjusted.

Increase the minimum field current clockwise.

Nominal value reduction

By closing a contact between X1:1 and X1:6 referenced to X1:5 or applying a voltage between 10...30V at X1:6 referenced to X1:5 the setted current nominal value can be halved. (Stand - by - switching)

Function - LED11.

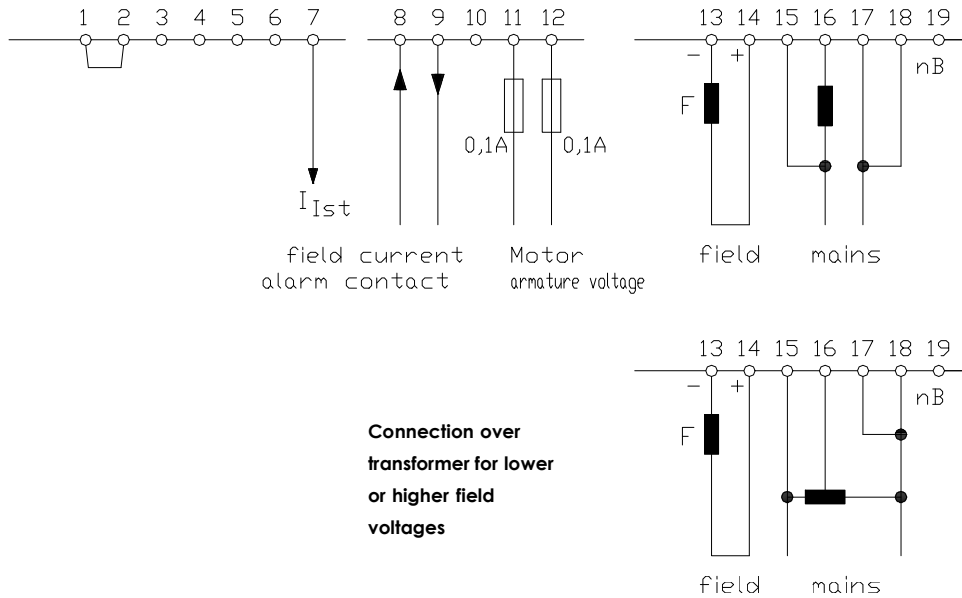
The minimum field current is not influenced.

4 Adjustment

Detach switching

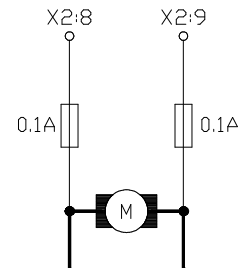
With combined armature-field-regulation is the motor until the detach point in the armature regulating range and then in the fieldweakening range controlled. This means, that until the detach point constant torque with rising power and over the detach point constant power with decreasing torque, caused by the field weakening is available.

connection plan detach switching



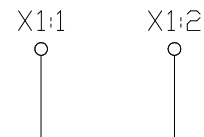
Connection armature voltage

The armature voltage is connected to X2:11 and X2:12. The maximum supply voltage is $\pm 450V$. The connection must be fused direct at be tap with 0,1A. The armature voltage input is a high-resistive comparator with 1mA discharge current.



Enable

The enable input X1:2 is direct brighted to the voltage output X1:1.

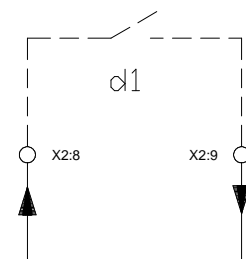


Field current signal

The field current signal can be adjusted between 0...100% field current.

The relay d1 operates, when the field current is higher than the adjusted value.

LED D5 emits, if the relay operates.



Basis adjustment

Switch S1: Contact 1=ON, Contacts 2,3,4 =OFF

Switch S4: Contact 1=ON, Contact 2 =OFF

Current adjustment

1. max. current
2. min. current

Maximum field current

Armature voltage 0V

The potentiometer P4 I_{min} - anti clockwise stop.

The potentiometer P8 - anti clockwise stop.

The potentiometer P6 I_{max} is adjusted:

max. field current minus min. field current

Increase the field current clockwise.

For example:

maximum field current 8A

minimum field current 2A

Potentiometer P6 $I_{max} = 6A$

Minimum field current

The potentiometer P8 - anti clockwise stop.

With the potentiometer P4 I_{min} a minimum field current between 0 and 30% from nominal current is adjusted.

Increase the minimum field current clockwise.

Detachpoint

With the potentiometer P8 U_A the detach point can be adjusted between 0V und $\pm 400V=$.

The detach point is indicated by LED D7.

Detachpoint - Adjustment

The potentiometer P8 is adjusted to clockwise stop.

Increase motorspeed up to the armature voltage is 10% over the wish-detach point.

For example:

Turn potentiometer P8 anti-clockwise until with constant speed the armature voltage go down to wish detach voltage.

The detachpoint is now adjusted to 400V armature voltage.

4 Adjustment

Adjustment **the dynamic control range**

Basic adjustment

Switch S1: Contacts 1,4 =ON, Contacts 2,3 =OFF

Contacts function

Contacts 1,2 capacitor I-Component

Contacts 3,4 Resistor P-Component

Adjustment contacts by switch S1:

P-values	amplification	K3	K4
150 kΩ	3	OFF	OFF
60 kΩ	1,2	OFF	ON
36 kΩ	0,8	ON	OFF
26 kΩ	0,5	ON	ON
I-values		K1	K2
0,20 μF		OFF	OFF
0,77 μF		ON	OFF
1,14 μF		OFF	ON
1,61 μF		ON	ON

Integral - time constant P-value x I-value x 4

UNITEK products have a warranty against defects in material and workmanship for a period of one year from the date of shipment. All values from the pre- and final quality control checks are archived with the devices' serial numbers. UNITEK does not guarantee the suitability of the device for any specific application.

During the warranty period, UNITEK will, at its option, either repair or replace products that prove to be defective, this includes guaranteed functional attributes. UNITEK specifically disclaims the implied warranties or merchantability and fitness for a particular purpose. For warranty service or repair, this product must be returned to a service facility designated by UNITEK.

For products returned to UNITEK for warranty service, the Buyer shall prepay shipping charges to UNITEK and UNITEK shall pay shipping charges to return the product to the Buyer.

However, the Buyer shall pay all shipping charges, duties, and taxes for products returned to UNITEK from another country.

The foregoing warranty shall not apply to defects resulting from:

- * improper or inadequate repairs effected by the Buyer or a third party,
- * non-observance of the manual which is included in the all consignments,
- * non-observance of the electrical standards and regulations
- * improper maintenance
- * acts of nature

All further claims on transformation, diminution and replacement of any kind of damage, especially damage, which does not affect the UNITEK device, cannot be considered. Follow-on damage within the machine or system, which may arise due to malfunction or defect in the device cannot be claimed. This limitation does not affect the product liability laws as applied in the place of manufacture (i. e. Germany).

UNITEK reserves the right to change any information included in this MANUAL. All connection circuitry described is meant for general information purposes and is not mandatory.

The local legal regulations, and those of the Standards Authorities have to be adhered to. UNITEK does not assume any liability, expressively or inherently, for the information contained in this MANUAL, for the functioning of the device or its suitability for any specific application.

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