

80V/230V (Without Field)

TA-2 E

Instruction and Operation Manual

valid for part.-no. 10201-1F, 10206-0F

Caution:

*There is always a risk involved in the handling of electrical machinery!
Therefore mounting and maintenance should only be done by authorized personnel.*

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Read these instructions carefully before installation, adjustments and operating of the drive control.

1. Technical data:

Measurements	refer to drawing page 7
Line Voltage	80VAC-50/60Hz / 230VAC - 50/60Hz
Power	1,5 kW / 2,7kW
Armature Voltage	60V /180V
Armature Current	25 A / 15A
Ambient Temperature	0-40°C
Speed Accuracy	3% with armature feedback 1% with tachometer feedback

Semiconrolled single phase bridge, inner loop current regulator, acceleration integrator.

2. Connection of unit: (refer also to connection diagram TA-2E, page 6)

Ensure that the voltage indicated on the name plate of the unit corresponds with your AC line voltage

Terminal Strip KL 1

- 1 - 2 AC input, voltage according to name plate on unit, frequency 50 Hz or 60 Hz. Terminal 1 - phase, terminal 2 - neutral.
- 3 - 4 Armature terminal 3 positive (+), terminal 4 negative (-)
- 7 - 8 Drive release, drive is released when contacts are closed.
- 12 Signal input (positive) without acceleration. Input voltage depends on rating of resistor R31, however max. voltage 150V DC Input current approx. 0,32 mA at max. speed.

R31 is calculated as follows:

$$R31 \text{ in kOhm} = 3 \times UE - 22$$

The speed potentiometer must be disconnected, terminal 10 and 11 must be connected, if input terminal 12 is used.

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13 - 14	DC tachometer, terminal 13 common ground, terminal 14 negative
9 - 10 - 11	Speed potentiometer, connect center to terminal 10, start, to terminal 11 and end to terminal 9. This potentiometer enables an infinite variable adjustment of the motor from minimum to maximum speed.

3. Drive control adjustment

Minimum speed	P1	Adjustment of minimum speed during operation. (set control fully counter clockwise)
Acceleration rate.	P2	Adjustment for the linear acceleration of motor from minimum to maximum speed. (adjustable from 2 sec to 20 sec)
Maximum speed	P3	Adjustment of maximum speed during operation. (set speed control fully clockwise)
IxR Compensation	P4	This control enables to compensate for the voltage drop in the armature and in the supply line when armature feedback is utilized. (This potentiometer must be set fully counter clockwise when tachometer feedback is used)
Current limit	P5	Adjustment of the requested armature current. Max. permissible armature current
Stability	P6	With this potentiometer the drive is dynamically adapted to the load.

3. Indicator lamps

The following functions are indicated with light emitting diodes (LED's)

LED 1	yellow	Drive release
LED 2	green	Power ON
LED 3	red	Current limit, Over-speed

5. Functional tests and adjustments before operation

a) Armature-voltage control (UA-control)

- 1) Check all connections with an Ohm-meter for grounds.
- 2) Install R18 150 kOhm (80V-line) / 470 kOhm (230V-line)
- 3) Check if your line voltage corresponds with the name plate on the unit
- 4) Potentiometer P1 Minimum speed, set fully counter clockwise.
Potentiometer P2 Acceleration rate, set in center position.
Potentiometer P4 I x R compensation, set fully counter clockwise.
Speed potentiometer Set fully counter clockwise
- 5) Switch on line voltage. The green LED 2 must now light up.
- 6) Switch on drive. The yellow LED 1 (drive release) will now light up.
- 7) Measure voltage at potentiometer terminals 9 and 11 (+15V). When turning the speed control clockwise, the armature voltage (and motor speed) will rise. With speed control turned fully clockwise adjust P3 for the requested armature voltage (motor speed). Now turn speed control fully counter clockwise, the output voltage will drop back to 0V, adjust potentiometer P1 (minimum speed) for the requested minimum speed.
- 8) Adjust I x R compensation potentiometer P4. Check for an approximate equal speed with and without motor load in the lower speed range. When the potentiometer is turned clockwise, the speed under load will increase. If the compensation potentiometer is set too high the drive will become unstable !
- 9) Current limit. For checking the current limit disconnect the motor and connect a armature choke. Switch on drive, preset a reference signal (speed) and adjust requested current with potentiometer P5. (this must cause the red diode LED 3 (current limit) to light up.
- 10) Acceleration rate. Adjust potentiometer P2 for the requested acceleration time. Turning this control clockwise will increase the acceleration rate.

b) Tachometer feedback control

- 1) Check all connections with an Ohm-meter for grounds.
- 2) For all further adjustments refer to the adjustments as described for the armature feedback control, however potentiometer P4 (I x R compensation) must be set fully counter clockwise. Tachometer adaption is performed with R18.

6. Trouble shooting

For fast and effective troubleshooting proceed as follows :

- Check drive for:
- a) Intermittent or loose connections
 - b) Defective insulation of connecting leads
 - c) Defective motor (brushes etc.)

CAUTION !
 Do not use any Megohm-meter, buzzer or similar test instruments. Test instruments must be galvanically seperated from the AC line. The electronic circuit carries a voltage potential against ground !

Fault location

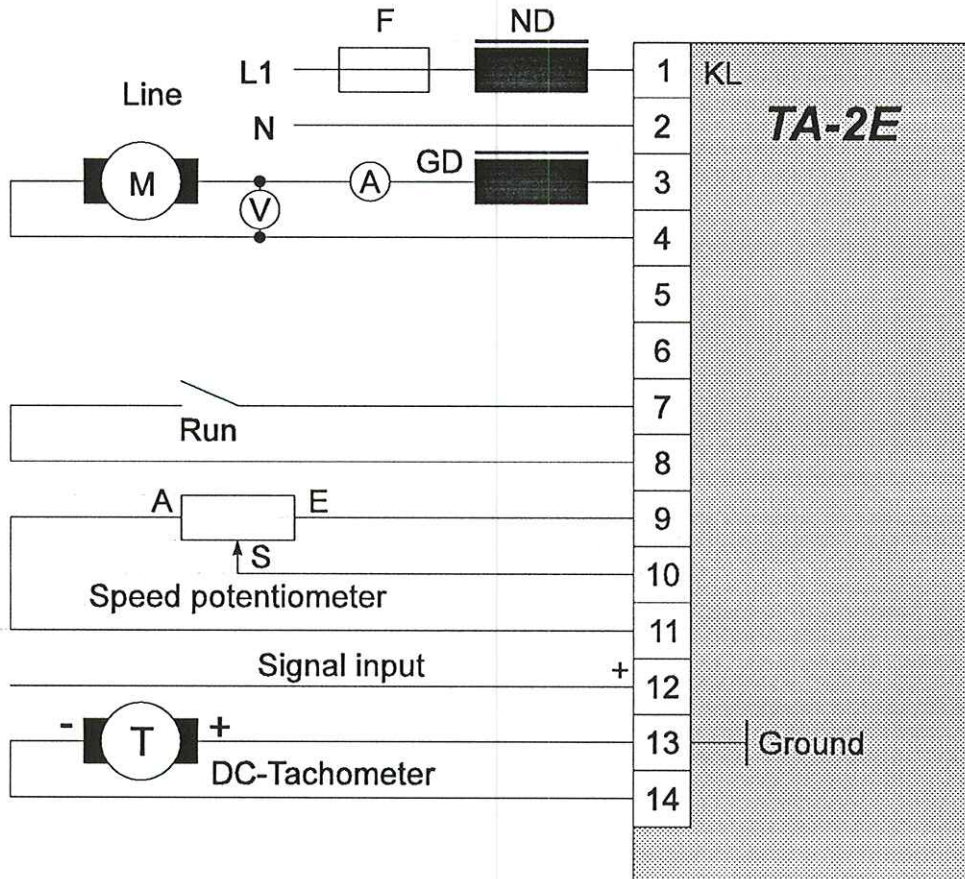
Sympton	Possible causes
Relay d1 is not energized when drive is released, (yellow LED does not light up)	<ul style="list-style-type: none"> a) Check lead connections b) Control voltage + 24V is missing, check power supply, LED 2 does not light up. c) Defective relay
Output voltage does not increase when speed potentiometer is turned up.	<ul style="list-style-type: none"> a) Motor load is too high. Drive operates at current limit. LED 3 (current limit) lights up. b) Defective Speed potentiometer.
Drive runs unstable	<ul style="list-style-type: none"> a) I x R compensation is set too high. b) Improper adjustment of stability potentiometer P6 c) Defective tachometer or tachometer leads. d) Wrong connection of auxiliary motor winding.
Speed varies without change of setting of speed potentiometer.	<ul style="list-style-type: none"> a) Current limit is set too low, LED 3 (current limit) lights up. b) Motor is overloaded (mechanical defect), LED 3 (current limit), lights up.

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Sympton	Possible causes
Speed varies without change of setting of speed potentiometer	<ul style="list-style-type: none">c) Defective supply for electronic circuit. +/- 15V incorrect or missing.d) Defective Thyristor or SCR bridge.e) Defective tachometer or tachometer leads.f) Defective speed potentiometer.
Main fuse blows	<ul style="list-style-type: none">a) Shorted or grounded armature connections. Check Thyristor bridge.b) Defective motor or armature
Drive does not run	<ul style="list-style-type: none">a) Defective power supplyb) Check relay and relay functions.c) Defective speed potentiometer.d) Check motor and brushes.
Drive runs at maximum speed when released, however speed control is set in zero position	<ul style="list-style-type: none">a) Defective tachometer or intermittent tachometer leads.b) Check armature connections (feedback)c) Defective maximum speed potentiometer P3d) Intermittent minimum speed potentiometer P1c) Check armature connections.e) Intermitten speed potentiometer or intermittent lead from terminal 11 to potentiometer.f) Wrong polarity on tachometer connections (refer to point 13-14)

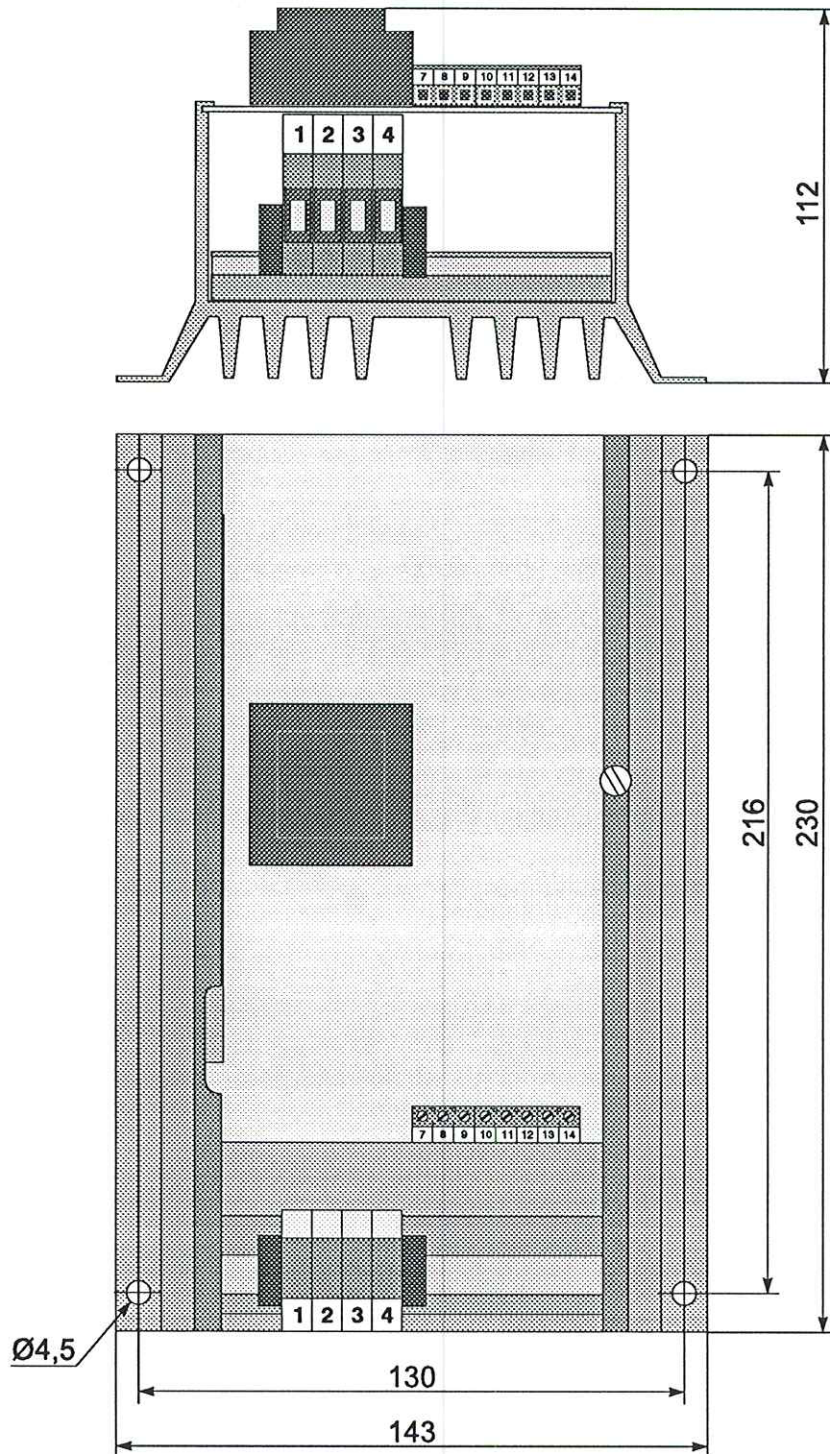
This concludes the preliminary preparations and adjustments of the Thyristor Drive Control Type TA-2E

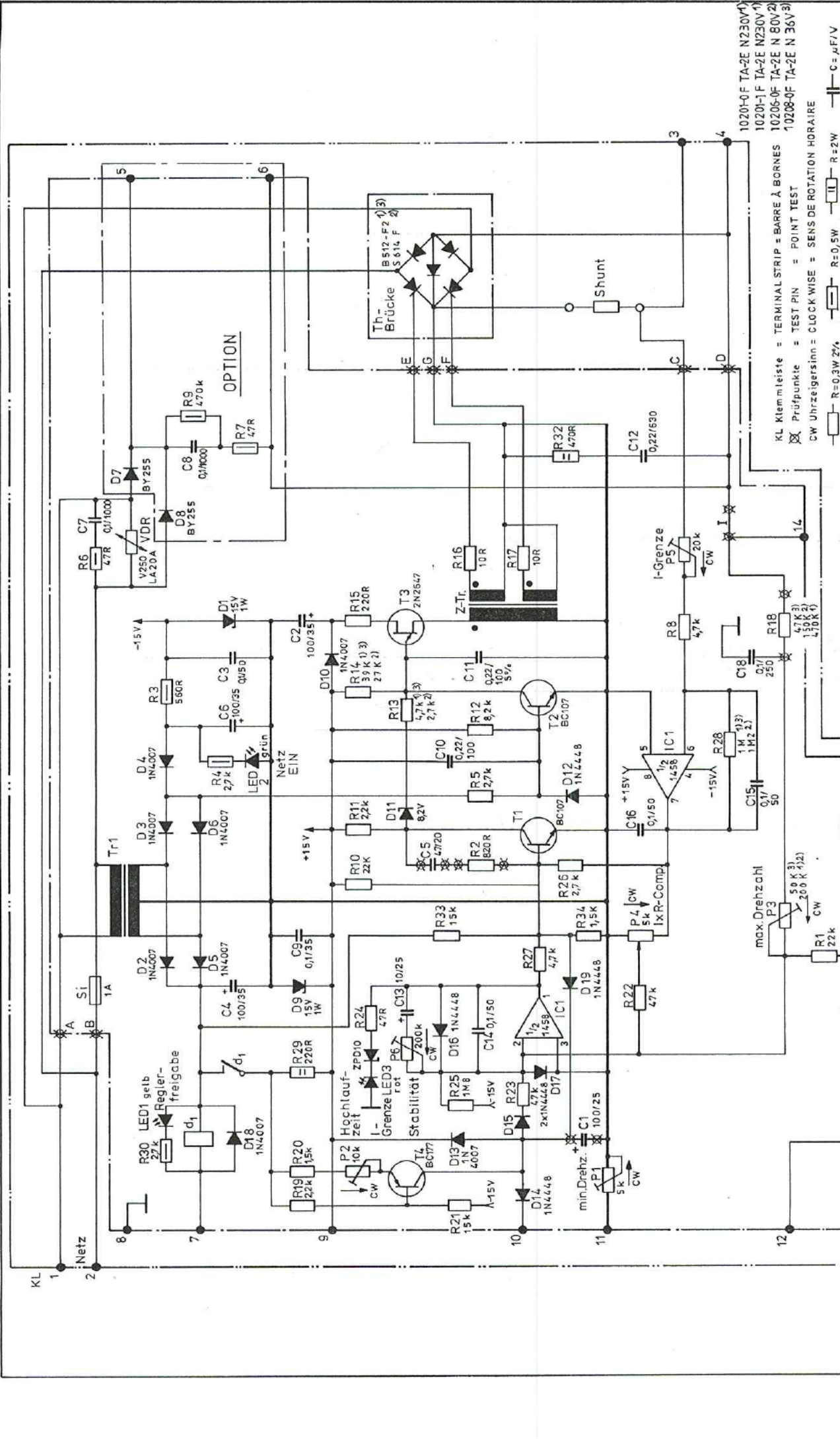
7.0 Connection diagram



8.0 Diagram of Dimensions

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1020-0F TA-2E N230V4)
 1020-1F TA-2E N230V4)
 10205-0F TA-2E N 80V2)
 10208-0F TA-2E N 36V3)

KL Klemmleiste = TERMINAL STRIP = BARRE À BORNES
 ☒ Prüfpunkte = TEST PIN = POINT TEST
 CW Uhrzeigersinn = CLOCK WISE = SENS DE ROTATION HORAIRE

R=0,3W 2% R=0,5W R=2W C=µF/V

TAE Antriebstechnik

Datum	Name
10 0089	16.2.89 Ro
9 0089	2.1.89 Re
8 0488	8.12.88 Re
7 01788	19.3.88 Re
6 01085	5.11.85 Re
5 00884	8.8.84 Re
4 00483	22.8.83 Re
3 00000	13.3.83 Re
2 00000	7.9.82 Re
1 00000	28.12.80 Re

Ausg.	Änd.-Nr.	Datum	Name
10	0089	16.2.89	Ro
9	0089	2.1.89	Re
8	0488	8.12.88	Re
7	01788	19.3.88	Re
6	01085	5.11.85	Re
5	00884	8.8.84	Re
4	00483	22.8.83	Re
3	00000	13.3.83	Re
2	00000	7.9.82	Re
1	00000	28.12.80	Re

Bezeichnungen
 Reglerfreigabe
 P1 min. Drehzahl
 P2 Hochlauf
 P3 max. Drehzahl
 P4 IxR Kompensation
 P5 Stromgrenze
 P6 Stabilität

Bezeichnungen
 I & Stop
 II & Start (Drehzahl 0)
 III & Start (Drehzahl 50%)
 Wichtig!
 Alle Messungen müssen potentialfrei durchgeführt werden,
 da Masse Spannung gegen Erde führt (Masse & KL / 8 u. 13)

DESIGNATION
 = CONTROL RELEASE = DEBLOCAGE DE REGULTEUR
 = MIN SPEED = VITESSE MIN
 = ACCEL RATE = ACCELERATION
 = MAX SPEED = VITESSE MAX
 = IxR COMP = COMPENS. Ö INUIT
 = LIMIT - LIMIT
 = STABILITY = STABILITÉ

Bezeichnungen
 Ozziogramme gemessen gegen Masse (nicht Erde)
 I & Stop
 II & Start (Drehzahl 0)
 III & Start (Drehzahl 50%)
 Wichtig!
 Alle Messungen müssen potentialfrei durchgeführt werden,
 da Masse Spannung gegen Erde führt (Masse & KL / 8 u. 13)

Zeichnungs-Nr.
 TA-2 E
 10201
 12 80
 S1