

Time counters / Time relays

Time counters show how long equipment, machines and other devices have been switched on. They show information about elapsed warranty time, usage and whether it's time to carry out maintenance work. We also have a range of time preset counters in our program for use with time based controllers.

As a further option, we offer a line of modern, well designed Time relays with a wide range of programming options

Typical applications:

- Operating hours recording
- Service time counting
- Service life tests
- Maintenance interval counter
- Time control
- Time delays
- After run control
- Pulse shaper
- Timed on and off switching
- Shorttime measurement and monitoring up to 1 ms
- Sports timing
- Throughput time control
- Curing time control
- Mixing process control
- Oven control
- Light control
- Machine runtime recording

Electronic Time Counters



| Type | tico 731 | tico 732 | tico 734 006 |
|---|--|--|--|
| Features | <ul style="list-style-type: none"> ■ Small, compact, 5 different versions ■ Voltage supply via lithium cell or 12-24 VDC ■ 8-digit LCD or 6-digit LED display ■ Two versions with different time ranges for each type ■ High-voltage version for 12-250 VDC/AC input pulses ■ Optional with output signal for use as maintenance counter | <ul style="list-style-type: none"> ■ Multifunctional, used as counter, tachometer, time counter, shift or batch counter ■ Voltage supply 12-24 VDC; 115 VAC, or 230 VAC ■ 6-digit LCD or LED display ■ Offering a variety of programmable functions ■ Without or with 1 or 2 presets ■ Offering many adjustable time ranges ■ Resolution up to 1 ms ■ Programmable keyboard lockout ■ Integrated sun totalizing counter | <ul style="list-style-type: none"> ■ Totalizing counter with large 6-digit LCD display; illuminated ■ 4 different programmable time ranges ■ Voltage supply via exchangeable lithium cell ■ Small mounting depth ■ Expandable by a variety of module options ■ 10 versions of the same design are offering different functions |
| Technical Data | | | |
| Dimensions (mm) (Width x Height x Depth) | 48 x 24 x 32 short 48 x 24 x 60 long | 48 x 48 x 93.5 | 72 x 36 x 36 |
| Front panel cutout (mm) | 45 x 22.5 | 45 x 45 | 68 x 33 |
| Display | LCD 8-digit, 7 mm LED 6-digit, 7.6 mm | LCD 6-digit, 9 mm LED 6-digit, 7.6 mm | LCD 6-digit, 12 mm |
| Protection | IP 65 | IP 65 | IP 65 |
| Supply voltage | Li battery, type 1+3, 12-24 VDC | 12-24 VDC, 115 VAC, 230 VAC versions | Exchangeable Li battery |
| Inputs | | | |
| Input control | PNP/NPN, type 3 with 12-250 VDC/AC | PNP/NPN | PNP/NPN |
| Time format | hhhhhh.hh; hhhh:mm:ss; (LCD) hhhh.hh; hh:mm:ss (LED) | Sec, min, hours, decimal point up to 0.000 or programmable format hh:mm:ss | ssssss; mmmmm.m; hhhhh.h; hh:mm:ss; programmable |
| Measuring principle | Accumulated measurement; Pulse-width | Accumulated or single- pulse measurement; Pulse-width or period duration | Accumulated measurement; Pulse-width |
| Reset input | NPN type 1+2, type 3 with 12-250 VDC/AC; NPN/PNP Type 4-5 | PNP/NPN | NPN |
| Control inputs | Optional: Keylock or Display hold input | 2 nd counter input and display input | Keylock input |
| Output | Optional as transistor PNP or display | Without, or with 1 or 2 relays and transistor outputs | Optional as SSR output |
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Electromechanical Time Counters



| Type | Type 891 | Type 891 DIN | Type 478 | Type 633 DC |
|---|---|---|--|---|
| Features | <ul style="list-style-type: none"> ■ 7-digit display ■ Without reset function ■ DIN dimensions 48 x 24; 48 x 48 and 72 x 72 via adapter frame ■ Low-cost ■ Screw-type terminal connections | <ul style="list-style-type: none"> ■ 7-digit display ■ Without reset function ■ DIN-rail mounting ■ Compact design ■ Low-cost ■ Screw-type terminal connections | <ul style="list-style-type: none"> ■ 6- or 7-digit display ■ Manual reset function or without reset function ■ Plugs into modular system 400 ■ Easy to service | <ul style="list-style-type: none"> ■ Small building dimensions ■ Low power consumption ■ Standard connections ■ Suitable for PCB mounting ■ Machine-solderable and washable ■ High shock resistance |
| Technical Data | | | | |
| Dimensions (mm) (Width x Height x Depth) | 48 x 24 x 40.5 | 48 x 70 x 49 | 50 x 25 x 75.5 | 25.2 x 31 x 14.6 30 x 20 x 40 |
| Front panel cutout (mm) | 45 x 22.5 | | 50 x 25 | 27 x 14.2; only .8 |
| No. of digits/ | 7 | 7 | 6 or 7, depending on version | 7 |
| Digit height | 5 mm (visual) | 5 mm (visual) | 4 mm | 4 mm (visual) |
| Protection | IP 66 | IP 66 | IP 40 | IP 65 |
| Pulse voltage | 12-36 VDC; 24 VAC; 115 VAC; 230 VAC; further voltages available as options | 12-36 VDC; 24 VAC; 115 VAC; 230 VAC; further voltages available as options | 12 VDC; 24 VDC; 24 VAC; 115 VAC; 230 VAC; depending on version | 5; 12; 24 VDC |
| Power consumption | DC 0.75 W; AC 0.7 VA | DC 0.75 W; AC 0.7 VA | Approx. 1 VA | Approx. 30 mW |
| Reset | None | None | None; manual - depending on version | None |
| Operating temperature | - 10...50 °C | - 10...50 °C | - 10...50 °C; | - 10...50 °C; optional - 40...+ 85 °C |
| Time format | hhhhh.hh | hhhhh.hh | hhhh.hh or hhhhh.hh | hhhhh.hh |
| Accessories | Panel frame adapter | | Panel frame, connection box | |
| Dimensions (mm) (including panel frame) | 54 x 29; 48 x 48; 52 x 52; 72 x 72; D 73; D 58 | | 60 x 50 x 88 | |
| Cutout (mm) (including panel frame) | 50 x 25; 45 x 45; D 50; 68 x 68; D 50; D 50 | | 55 x 29.5 | |
| Page | 174 | 176 | 178 | 180 |

Electromechanical Time Counters



| Type | Type 633 DIN | Type 633 AC | | |
|---|---|--|--|--|
| Features | <ul style="list-style-type: none"> ■ Suitable for DIN-rail mounting ■ Suitable for installation in switching cabinets ■ Screw-type terminal connections ■ Without reset function ■ Low power consumption | <ul style="list-style-type: none"> ■ Small AC voltage meter ■ Low power consumption ■ Simple installation ■ Protection class IP 65 ■ Screw-type terminal connections or cable connections | | |
| Technical Data | | | | |
| Dimensions (mm) (Width x Height x Depth) | 25.5 x 68.5 x 28 | 30 x 20 x 56 | | |
| Front panel cutout (mm) | | 27 x 14.4 | | |
| No. of digits | 7 | 6 | | |
| Digit height | 4 mm (visual) | 4 mm (visual) | | |
| Protection | IP 10 | IP 66 | | |
| Pulse voltage | 5, 12 or 24 VDC, depending on version | 24, 115, 230 VAC | | |
| Power consumption | Approx. 250 mW | 0.08 -1 VA | | |
| Operating temperature | 0...60 °C | - 10...50 °C | | |
| Time format | hhhhh.hh | hhhhh.h | | |
| Accessories | | Panel frame | | |
| Page | 182 | 183 | | |

Electronic Preset Time Counters



| Type | tico 732 | tico 734 008 | tico 735P6 |
|---|---|---|--|
| Features | <ul style="list-style-type: none"> ■ Multifunctional, used as counter, tachometer, time counter, shift or batch counter ■ Voltage supply 12-24 VDC; 115 VAC, or 230 VAC ■ 6-digit LCD or LED display ■ Variety of programmable functions ■ Without presets or with 1 or 2 presets ■ Variety of adjustable time ranges ■ Resolution up to 1 ms ■ Programmable keyboard lock ■ Integrated sum totalizing counter | <ul style="list-style-type: none"> ■ Totalizing counter with large, 6-digit LCD display; illuminated ■ Different time, 4 ranges programmable ■ Voltage supply via exchangeable lithium cell ■ Small mounting depth ■ Expandable by a variety of module options ■ 10 versions offering different functions (same design) | <ul style="list-style-type: none"> ■ Large dual-colour, 5-digit LED display; digit height 18.5 mm ■ Programmable display colour ■ Different time, 5 ranges programmable ■ Upgrading options (e.g. RS 485) ■ Service-friendly due to plug-in system ■ Complete functions by 8 counter versions and 5 process indicators |
| Technical Data | | | |
| Dimensions (mm) (Width x Height x Depth) | 48 x 48 x 93.5 | 72 x 36 x 36 | 96 x 48 x 100 |
| Front panel cutout (mm) | 45 x 45 | 68 x 33 | 92 x 45 |
| Display | LCD 6-digit, 9 mm LED 6-digit, 7.6 mm | LCD 6-digit, 12 mm | LED 5 digit, 18.5 mm Dual-colour |
| Protection | IP 65 | IP 65 | IP 66 |
| Supply voltage | 12-24 VDC, 115 VAC, 230 VAC versions | Exchangeable Li battery | 22-55 VDC / 20-50 VAC or 90-264 VAC |
| Inputs | | | |
| Input control | PNP/NPN | PNP/NPN | PNP/NPN |
| Time format | Sec., min, hours, with decimal point up to 0.000; or programmable format hh:mm:ss | sssss; mmmm.m; hhhh.h; hh:mm:ss; programmable | sss.s; mmm.m; hhh.h; mm.ss; hh.mm; programmable |
| Measuring principle | Accumulated or single-pulse measurement; Pulse width or period duration | Accumulated measurement Pulse width | Accumulated or single-pulse measurement Pulse width |
| Reset input | PNP/NPN | NPN | NPN |
| Control inputs | Display hold input | Keylock | Keylock |
| Control inputs | Display buffer input | Keyboard lock | Keyboard lock |
| Output | Without, or with 1 or 2 relays and transistor outputs | As SSR output | 1 relay and transistor output |
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Flexible Counter Series in DIN size 24 x 48 mm

tico 731



- high contrast 8-digit LCD display or brilliant 6-digit LED display
- different supply voltages available:
 - independent of mains supply with lithium battery or
 - maintenance-free and environmentally friendly with 12-24 VDC supply
- also high-voltage input 12-250 VAC/VDC
- up to 8 different functions for each standard model:
 - 01 Pulse counter
 - 02 Tachometer (1/min)
 - 03 Time counter (display in hhhh:mm:ss)
 - 04 Time counter (display in hhhhhh,hh)
 - 05 Numerical display for the PLC (serial)
 - 06 Bidirectional position indicator
 - 07 Counter with differential mode
 - 08 Maintenance counter (on request)



| Standard Models | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 |
|-----------------|--------|--------|--------|--------|--------|
|-----------------|--------|--------|--------|--------|--------|

| Hardware | | | | | |
|--|-------------------------------------|-------------------------------------|---|-------------------------------------|-------------------------------------|
| Display | 8-digit LCD | 8-digit LCD | 8-digit LCD | 8-digit LCD | 6-digit LED |
| Supply voltage | Lithium battery | 12 – 24 VDC | Lithium battery | 12 – 24 VDC | 12 – 24 VDC |
| Nominal data retention | 7 years | NV-FRAM > 10 years | 7 years | NV-FRAM > 10 years | NV-FRAM > 10 years |
| Active edge negative or positive edge programmable | x | x | x | x | x |
| Amplitude thresholds | < 0.7 and > 5 V, max. 30 V DC | < 0.7 and > 5 V, max. 30 V DC | < 3 V and > 12 V max. 250 V DC/AC | < 0.7 and > 5 V, max. 30 V DC | < 0.7 and > 5 V, max. 30 V DC |
| Counting frequency programmable | max. 7.5 kHz or 30 Hz attenuated | max. 7.5 kHz or 30 Hz attenuated | 20 Hz | max. 7.5 kHz or 30 Hz attenuated | max. 7.5 kHz or 30 Hz attenuated |
| Control inputs | Reset and Keylock | Reset | Reset and Keylock | Reset and application input | Reset and application input |
| Keylock | external input | programmable | external input | programmable | programmable |
| Mounting depth | 32 mm | 32 mm | 60 mm | 60 mm | 60 mm |

| Software | | | | | |
|-----------------------------------|---|---|---|---|---|
| Impulse counter | x | x | x | x | x |
| Tachometer 1/min | x | x | | x | x |
| Time counter h : 1/100 h x | | x | x | x | x |
| Time counter h : min : s x | | x | x | x | x |
| Numerical display for PLC | | x | | x | x |
| Position indicator bi directional | | | | x | x |
| Counter with differential mode | | | | | x |
| Maintenance counter (on request) | | | | | x |

Time counters/
Timer relays

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TYPE 1



TECHNICAL DATA

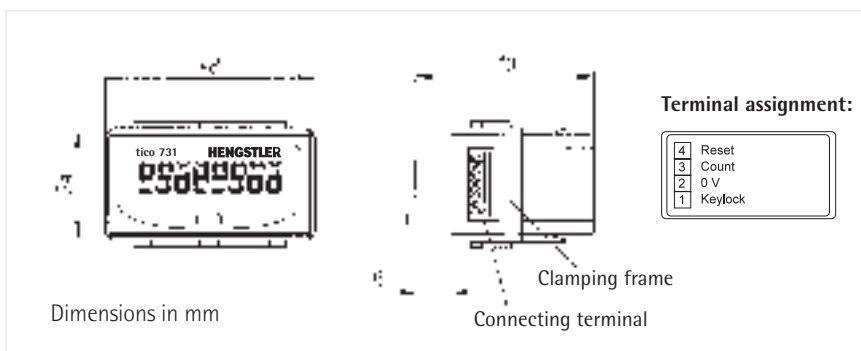
- LCD display
- lithium battery
- COUNT: programmable start input for voltage signal or contact, frequency 30 Hz
- RESET: reset input with contact (negative, 30 Hz)
- KEYLOCK: locking of the reset key
- short case

| | |
|-------------------------------|--|
| Operating temperature | -10 ... 50 °C |
| Storage temperature | -20 ... +60 °C |
| Electrical connection | screw terminals |
| Mounting | with clamping frame |
| Front panel cutout | 45 + 0.6 x 22 + 0.3 mm |
| Protection class (IEC 144) | front side IP 65, terminals IP 20 |
| Dynamic strength | 10 m/s ² (10 ... 150 Hz) according to IEC 68-T2-6 |
| Shock stability | 100 m/s ² (18 ms) according to IEC 68-T2-27 |
| General rating | according to EN 61010, protective system II |
| Input resistance | < 50 kOhm (static) |
| Display | 8-digit LCD, 7 mm |
| Supply voltage U _b | internal lithium battery |
| Nominal data retention | lithium battery: 7 years |

| | |
|----------------------|--|
| Inputs: | |
| Amplitude thresholds | voltage input up to 30 Hz: < 0.7 V and > 5 V, max 30 V DC |
| Active edge | negative or positive edge programmable |
| Counting frequency | programmable: 30 Hz (attenuated for contacts) |

| | |
|-----------------|---|
| Control inputs: | |
| reset | - manual reset via keyboard (can be locked) - external reset with static behaviour, active edge negative |
| Reset lock | - by means of bridge on keylock input to 0 V |

DIMENSIONS CONNECTION DIAGRAM



ORDER NUMBER

Model tico 731

| | | | | |
|---|-----|---|---|---|
| 0 | 731 | 1 | 0 | 3 |
| 0 | 731 | 1 | 0 | 4 |

* Option: with plug-in screw terminals

* S

Software function

- 01 impulse counter
- 02 tachometer (1/min)
- 03 time counter (hhhh:mm:ss)
- 04 time counter (hhhhh.hh)

TYPE 2



TECHNICAL DATA

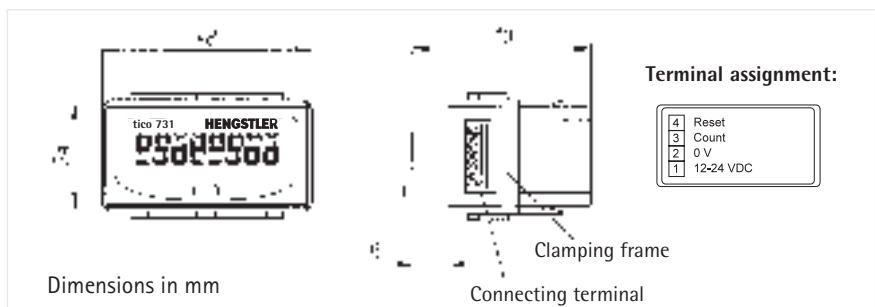
- LCD display
- DC supply voltage 12 – 24 V DC
- COUNT: programmable start input for voltage signal or contact, frequency 30 Hz
- RESET: reset input with contact (negative, 30 Hz)
- short case

| | |
|-------------------------------|--|
| Operating temperature | -10 ... 50 °C |
| Storage temperature | -20 ... +60 °C |
| Electrical connection | screw terminals |
| Mounting | with clamping frame |
| Front panel cutout | 45 + 0.6 x 22 + 0.3 mm |
| Protection class (IEC 144) | front side IP 65, terminals IP 20 |
| Dynamic strength | 10 m/s ² (10 ... 150 Hz) according to IEC 68-T2-6 |
| Shock stability | 100 m/s ² (18 ms) according to IEC 68-T2-27 |
| General rating | according to EN 61010, protective system II |
| Input resistance | < 50 kOhm (static) |
| Display | 8-digit LCD, 7 mm |
| Supply voltage U _b | 12 ... 24 V DC |
| Current consumption DC | 12 ... 24 V DC < 5 mA |
| Nominal data retention | nonvolatile memory > 10 years |

| | |
|----------------------|--|
| Inputs: | |
| Amplitude thresholds | voltage input up to 30 Hz: < 0.7 V and > 5 V, max 30 V DC |
| Active edge | negative or positive edge programmable |
| Counting frequency | programmable: 30 Hz (attenuated for contacts) |

| | |
|-----------------|--|
| Control inputs: | |
| Reset | - manual reset via keyboard (can be locked) - external reset with static behaviour, active edge negative attenuated 30 Hz |
| Reset lock | programmable via front key |

DIMENSIONS CONNECTION DIAGRAM



ORDER NUMBER

Model tico 731

| | | | | | | |
|---|-----|---|---|---|---|--|
| 0 | 731 | 2 | 0 | 3 | S | * Option: with plug-in screw terminals |
| 0 | 731 | 2 | 0 | 4 | | |

Software function

- 01 impulse counter
- 02 tachometer (1/min)
- 03 time counter (hhhh:mm:ss)
- 04 time counter (hhhhh.hh)
- 05 numerical display for PC

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TYPE 3



TECHNICAL DATA

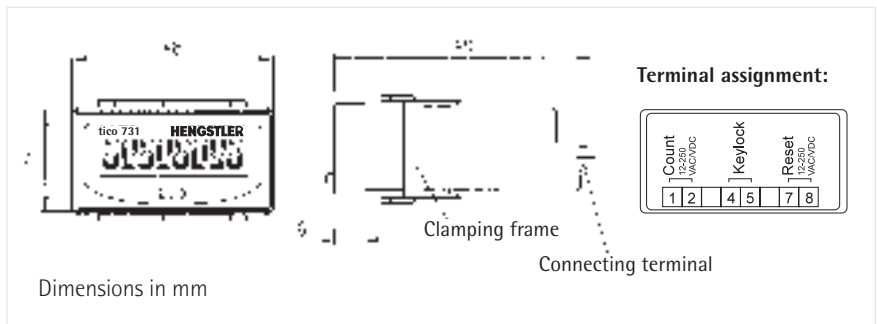
- LCD display
- Lithium battery
- COUNT: Start input for voltage pulses 12-250 V AC/DC (20 Hz)
- RESET: reset input for voltage pulses 12-250 V AC/DC (20 Hz)
- KEYLOCK: locking of the reset key
- long case

| | |
|-------------------------------|--|
| Operating temperature | -10 ... 50 °C |
| Storage temperature | -20 ... +60 °C |
| Electrical connection | screw terminals |
| Mounting | with clamping frame |
| Front panel cutout | 45 + 0.6 x 22 + 0.3 mm |
| Protection class (IEC 144) | front side IP 65, terminals IP 20 |
| Dynamic strength | 10 m/s ² (10 ... 150 Hz) according to IEC 68-T2-6 |
| Shock stability | 100 m/s ² (18 ms) according to IEC 68-T2-27 |
| General rating | according to EN 61010, protective system II |
| Input resistance | < 50 kOhm (static) |
| Display | 8-digit LCD, 7 mm |
| Supply voltage U _b | internal lithium battery |
| Nominal data retention | lithium battery: 7 years |
| Current consumption DC | lithium battery: 7 years |

| | |
|----------------------|---|
| Inputs: | |
| Amplitude thresholds | high voltage input 20 Hz: < 3 V and > 12 V, max. 250 V DC/AC |
| Active edge | voltage input positive edge |
| Counting frequency | 20 Hz |

| | |
|-----------------|---|
| Control inputs: | |
| Reset | - manual reset via keyboard (can be locked) - external reset with static behaviour, positive circuit |
| Reset lock | by means of bridge on the keylock input |

DIMENSIONS CONNECTION DIAGRAM



ORDER NUMBER

Typ tico 731



Software function
 01 impulse counter or
 03 time counter (hhh:mm:ss)
 04 time counter (hhhhh.hh)

TYPE 4

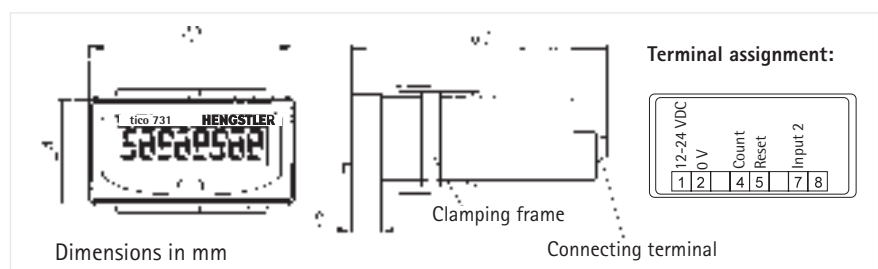


TECHNICAL DATA

- LCD display
- 12-24 V DC supply voltage
- COUNT: programmable start input for voltage signal or contact, frequency 30 Hz
- INPUT 2: control input for temporary hold of display value (Hold)
- RESET: reset input
- Long case

| | |
|-------------------------------|---|
| Operating temperature | -10 ... 50 °C |
| Storage temperature | -20 ... +60 °C |
| Electrical connection | screw terminals |
| Mounting | with clamping frame |
| Front panel cutout | 45 + 0.6 x 22 + 0.3 mm |
| Protection class (IEC 144) | front side IP 65, terminals IP 20 |
| Dynamic strength | 10 m/s ² (10 ... 150 Hz) according to IEC 68-T2-6 |
| Shock stability | 100 m/s ² (18 ms) according to IEC 68-T2-27 |
| General rating | according to EN 61010, protective system II |
| Input resistance | < 50 kOhm (static) |
| Display | 8-digit LCD, 7 mm |
| Supply voltage U _b | 12 ... 24 V DC |
| Current consumption DC | 12 ... 24 V DC < 50 mA |
| Nominal data retention | nonvolatile memory > 10 years |
| Count input: | |
| Amplitude thresholds | voltage input up to 30 Hz: < 0.7 V and > 5 V, max. 30 V DC |
| Active edge | negative or positive edge programmable |
| Counting frequency | programmable: 30 Hz (attenuated for contacts) |
| Control inputs: | |
| Reset | - manual reset via keyboard (can be locked) - external reset with static behaviour, 30 Hz attenuated same edge as with count input |
| Input 2: | Display Hold |
| Reset lock | programmable via front key |
| Voltage/switching current | voltage supply minus 2 V; max. 10 mA |

DIMENSIONS CONNECTION DIAGRAM



ORDER NUMBER

Model tico 731



- Software function**
- 01 impulse counter
 - 02 tachometer (1/min)
 - 03 time counter (hhhh:mm:ss)
 - 04 time counter (hhhhh.hh)
 - 05 numerical display for PLC
 - 06 bidirectional position indicator

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TYPE 5



TECHNICAL DATA

Technical data

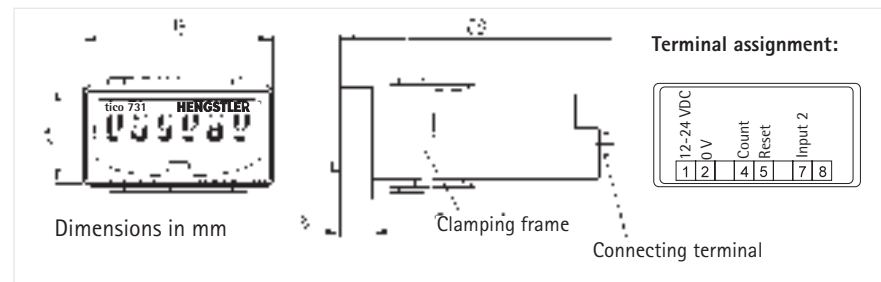
- LED display
- 12-24 V DC supply voltage
- COUNT: programmable start input for voltage signal or contact, frequency 30 Hz
- INPUT 2: control input for temporary hold of display value (Hold)
- RESET: reset input
- Long case

| | |
|-------------------------------|--|
| Operating temperature | -10 ... 50 °C |
| Storage temperature | -20 ... +60 °C |
| Electrical connection | screw terminals |
| Mounting | with clamping frame |
| Front panel cutout | 45 + 0,6 x 22 + 0,3 mm |
| Protection class (IEC 144) | front side IP 65, terminals IP 20 |
| Dynamic strength | 10 m/s ² (10 ... 150 Hz) according to IEC 68-T2-6 |
| Shock stability | 100 m/s ² (18 ms) according to IEC 68-T2-27 |
| General rating | according to EN 61010, protective system II |
| Input resistance | < 50 kOhm (static) |
| Display | 6-digit LED, 7 mm |
| Supply voltage U _b | 12 ... 24 V DC |
| Current consumption DC | 12 ... 24 V DC < 50 mA |
| Nominal data retention | nonvolatile memory > 10 years |

| | |
|----------------------|---|
| Count input: | |
| Amplitude thresholds | voltage input up to 30 Hz: < 0.7 V and > 5 V, max. 30 V DC |
| Active edge | negative or positive edge programmable |
| Counting frequency | programmable: 30 Hz (attenuated for contacts) |

| | |
|---------------------------|--|
| Control inputs: | |
| Reset | - manual reset via keyboard (can be locked) - external reset with static behaviour, 30 Hz attenuated same edge as count input |
| Input 2: | Display Hold |
| Reset lock | programmable via front key |
| Voltage/switching current | supply minus 2 V; max. 10 mA |

DIMENSIONS CONNECTION DIAGRAM



ORDER NUMBER

Model tico 731

| | | | | |
|---|-----|---|---|---|
| 0 | 731 | 5 | 0 | 3 |
| 0 | 731 | 5 | 0 | 4 |

- Software function**
- 01 impulse counter
 - 02 tachometer (1/min)
 - 03 time counter (hhh:mm:ss)
 - 04 time counter (hhhhhh.hh)
 - 05 numerical display for PLC
 - 06 bidirectional position indicator
 - 07 counter with differential mode (1 kHz)

SPECIAL FUNCTIONS

To best match your application, you can order special functions such as prescaler value, decimal point and preset value, which are permanently set by us before delivery. With the variable prescaler value you can adapt to already existing transfer ratios of your application. Small resolutions can be shown with the decimal point, e. g. for the position indicator or the tachometer.

A special feature is the possibility of displaying an information text in the display, e. g. for the surveillance of maintenance cycles. In this case the desired information is shown in the display after reaching the fixed preset value. You can display any text that can be created with the 7-segment alphabet, e. g. STOP, HELP, FILTER etc.

ORDER NUMBER SPECIAL VERSIONS

| Special functions for | Impulse counter | Tacho-meter | Time counter | Numerical display | Position indicator | Counter with differential work |
|--|-----------------|-------------|--------------|-------------------|--------------------|--------------------------------|
| Prescaler value 0.000015 to 65535.99998 | x | x | | | x | x |
| Decimal point 0 to 3 positions behind the comma | x | x | | | x | x |
| Preset value 0 to 99 999 999 | x | | x | | | |
| Information text (on reaching the preset value) LCD = 8 characters LED = 6 characters | x | | x | | | |

ORDER NUMBER SPECIAL VERSIONS

Choose version and basic function:

Model tico 731



* Option: with plug-in screw terminals only for standard model 1, 2

Standard version:

- 1 Standard model 1
- 2 Standard model 2
- 3 Standard model 3
- 4 Standard model 4
- 5 Standard model 5

Function:

- 1 Impulse counter
- 2 Tachometer (1/min)¹⁾
- 3 Time counter (hhhh:mm:ss)
- 4 Time counter (hhhhh.hh)
- 6 Position indicator (2-channel)²⁾
- 7 Counter with differential mode³⁾

- 1) not available for standard type 3
- 2) not available for standard types 1, 2, 3
- 3) only available for standard type 5

Please state the desired special version on your order:

P: (Value);

Prescaler value: 0.000015 to 65535.99998⁴⁾

D: (Value);

Decimal point: 0 to 3 positions after the comma⁴⁾

V: (Value);

Preset value: 0 to 99 999 999⁵⁾

T: (Text);

The information text displayed on reaching the preset value can be built up as required from the 7-segment alphabet

- 4) not available for time counters
- 5) not available for tachometers and position indicator

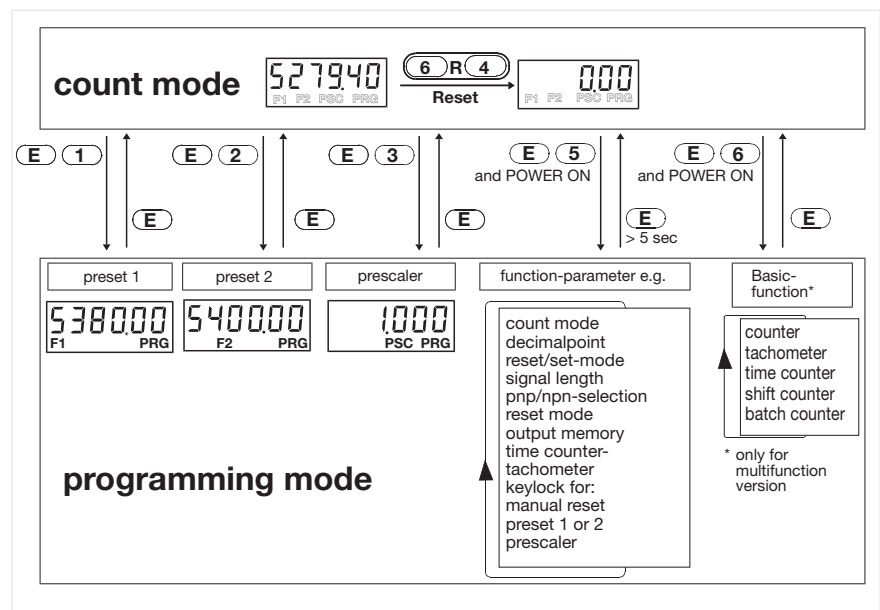
tico 732



PROGRAMMING

Bi-directional Multifunction-Counter

- high-contrast LED or LCD-Display, 6 digits
- small and compact DIN dimensions 48 x 48 mm
- easy operation by one key per digit
- direct access to parameters
- available with 1 or 2 presets
- transistor and relay with changeover contact, for each preset
- with integrated separate totalizer
- 5 basic functions easily programmable: counter, tachometer, time counter, shift counter and batch counter
- display range from - 99999 to 999999



The important values, preset 1, preset 2, prescaler and separate totalizer can be directly selected. It is necessary only to press the relevant button and the E-button together. To make the operation still more easy, access to those values can be locked separately. All other system parameters like operation and count modes are laid down in a common operation level. These parameters are usually programmed once only during the first initiation.

TECHNICAL DATA

General

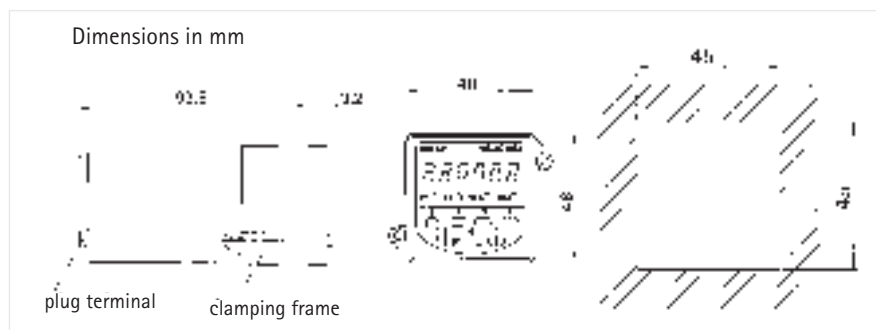
| | |
|----------------------------|---|
| Display | LED or LCD, 6 digits, leading zero suppression, decimal point |
| Digit height | LED 7,6 mm; LCD 9 mm |
| Supply voltage | 12...24 VDC; VAC; 115 VAC; 230 VAC; 50/60 Hz, depending on version |
| Current consumption | 12...24 VDC < 150 mA 100/115/230 VAC < 50 mA; including sensor supply |
| Sensor supply | only when AC operated: 12 ... 30 VDC, max 50 mA |
| Data retention | non-volatile memory > 10 years |
| Operating temperature | 0 ... +50 °C |
| Storage temperature | - 20 ... + 70 °C |
| Electrical connection | screw terminals |
| Mounting | with clamping frame |
| Protection class (IEC 144) | front side IP 65, terminals IP 20 |
| Vibro stability | 10 m/s ² (10...150 Hz) according to IEC 68-T2-6 |
| Shock stability | 100 m/s ² (18 ms) according to IEC 68-T2-27 |
| General rating | according to VDE 0411, DIN 57411, protection class II |
| Approvals | UL + CUL E 96337 |
| Amplitude thresholds | < 2 V and > 8 V or < 2 V and > 3.8 V with TTL level, max 40 VDC |
| Active edge | programmable; positive with pnp input; negative with npn input |
| Pulse shape | any (squarewave 1:1 for max. frequency) |
| Input resistance | approx. 10 kOhm (static) |
| Counting frequency | max. 5 kHz (2.5 kHz bi-directional) |
| Prescaler | programmable from 0.001 to 9.999 (999.999) |
| Count inputs A, B | - phase discriminator with single evaluation - differential mode (add/sub) - count direction mode - totalizing mode (add/add) |
| Pulse length min. | 17 ms (30 Hz), 100 µs (5 kHz) |
| Control input C | - manual reset possible - external reset, static or dynamic, programmable, pulse length > 5 ms - automatic reset when main preset has been reached (programmable) |
| Relay | changeover contact max. 250 VAC / 30 VDC, min. 5 V AC/DC max. 1 A, min. 10 mA, delay < 5 ms |
| Transistor | pnp output 12...24 VDC max 10 mA of DC supply; 12 ... 30 V DC max 10 mA of AC supply |
| Tacho | |
| Method | time interval (1/Tau) |
| Display range | 1/min or 1/sec |
| Min input frequency | 0.125 Hz = 8 sec |
| Alarms | 2 alarms with programmable start-up-suppression |
| Time bases | programmable; sec, min., h or hh.mm.ss |
| Resolution | programmable 1; 0.1; 0.01; 0.001 (on sec = 1 ms) |
| Function | single pulse measurement (short time meter) or cumulated counting (hour meter) |
| Count mode | pulse width or period measurement (start-stop) |

Counter

Tacho

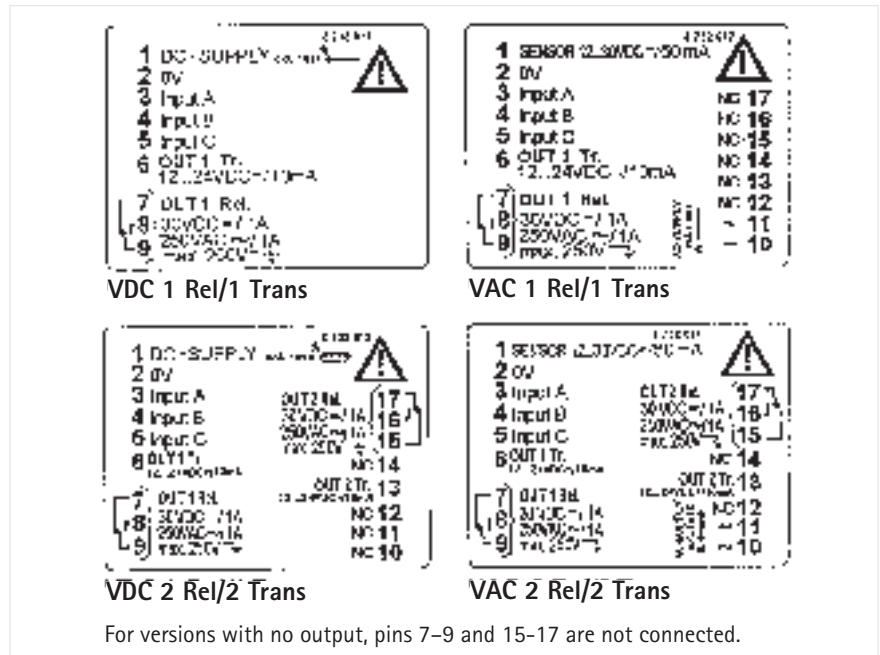
Time-counter

DIMENSIONS

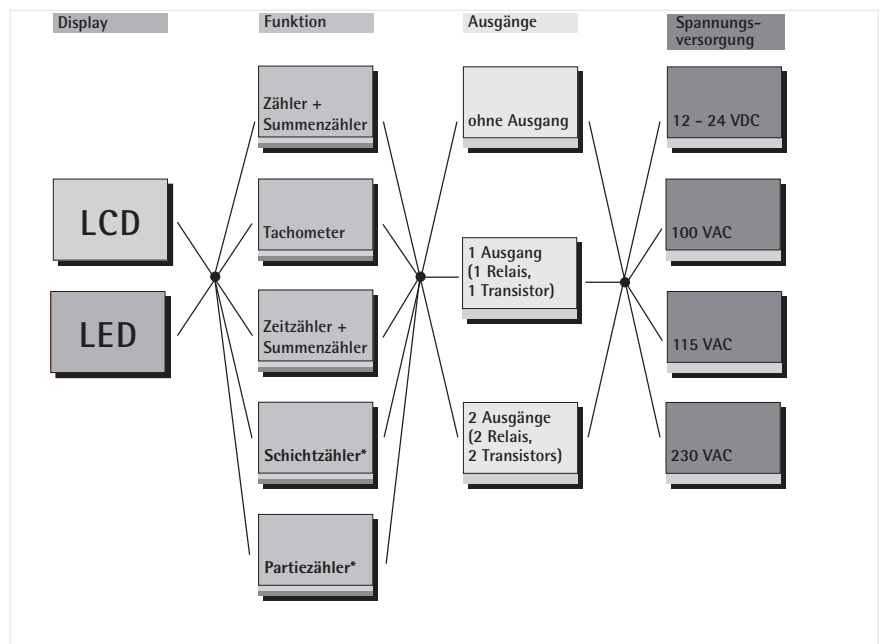


Time counters/
Timer relays

CONNECTING DIAGRAM



POSSIBLE VARIANTS



Multifunctional version: Article No.: 0 732 0 B

ORDER INFORMATION

| Display | Preset | 12-24 VDC | 24 VAC | 115 VAC | 230 VAC |
|---------|--------|-----------|-----------|-----------|-----------|
| LCD | - | 0 732 000 | 0 732 071 | 0 732 037 | 0 732 001 |
| LCD | 1 | 0 732 002 | 0 732 073 | 0 732 039 | 0 732 003 |
| LCD | 2 | 0 732 012 | 0 732 078 | 0 732 049 | 0 732 013 |
| LED | - | 0 732 018 | 0 732 080 | 0 732 055 | 0 732 019 |
| LED | 1 | 0 732 020 | 0 732 082 | 0 732 057 | 0 732 021 |
| LED | 2 | 0 732 030 | 0 732 087 | 0 732 067 | 0 732 031 |

Important: only versions with 2 presets or without preset can be used as tachometers.

in DIN size 36 x 72 mm



MODEL OVERVIEW

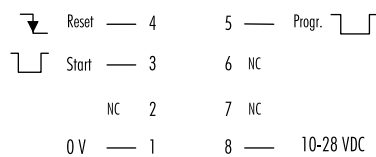
- LCD display, 8 digits, 12 mm height, excellent contrast through
- Backlighting with a 10-28 VDC supply
- Lithium battery power supply
- Decimal point, input scaling, count direction, output mode, etc. programmable, depending on model
- Programming reduced to a minimum for easy handling and set-up
- CE approval, IP 65, NEMA 4
- Suitable for TTL
- Mounting depth 29 mm

The family **tico 734** consists of ten models:

| | |
|-----------|--|
| 0 734 000 | Totalizer without scaling |
| 0 734 001 | Add/Subtract totalizer |
| 0 734 002 | Position indicator |
| 0 734 003 | Tachometer |
| 0 734 004 | Programmable rate meter |
| 0 734 005 | Rate meter with totalizer |
| 0 734 006 | Time counter |
| 0 734 007 | Preset counter |
| 0 734 008 | Time preset counter |
| 0 734 009 | Rate meter 005; with total and pulsed output |

Elapsed Time Indicator (0 734 006)

6 digit, display format: 999999s, 99999.9m, 99999.9h, hh:mm:ss, reset key can be enabled/disabled

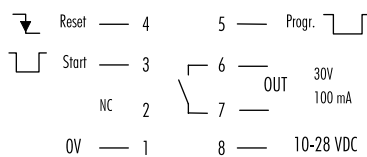


- 4 Remote reset, NPN
- 3 Timing Enable, NPN or dry contact
- 2 Not used
- 1 0V, Common
- 5 Program enable
- 6 Not used
- 7 Not used
- 8 DC-supply for backlighting

Suitable option modules: 1 734 0.. 10, 12, 14, 17, 19

Preset Timer (0 734 008)

6 digit, display format: 999999s, 99999.9m, 99999.9h, hh:mm:ss, programmable for up or down counting, SSR output programmable for on-delay or interval, reset key can be enabled/disabled, preset lock function



- 4 Remote reset, NPN
- 3 Timing Enable, NPN or dry contact
- 2 Not used
- 1 0V, Common
- 5 Program enable
- 6-7 Output SSR (Form A)
- 8 DC-supply for backlighting

Suitable option modules: 1 734 010 ... 20

tico 734

Technical data

Power Supply

Internal Single or dual lithium 3 V battery (CR 1/2 AA), typical life time of 5 years (10 yrs w/2 batteries). „Lo BAT“ display flashes approximately 2 weeks prior to end of battery life.

Display

via Option Module 120/240 VAC provides 12 VDC for display backlighting

Display LCD, 12 mm height, 8 digits

Backlighting Whole display area can be backlit with a 10-28 VDC supply, green-yellow colour

Count Inputs

High Speed Input (2) PNP, ≤ 28 VDC, max. 10 kHz (50 % duty cycle), Low < 1.0 V, High > 2.0 V, impulse > 45 μ s, impedance 1 M Ω

Low Speed Input (3) NPN, ≤ 28 VDC, max. 30 Hz (50 % duty cycle), Low < 1.0 V, High > 2.0 V, impedance 1 M Ω

High Voltage Option Module 100..260 VAC/DC, 30 Hz, 1 M Ω , with internal connection to input (3)

Low Voltage Option Module 5..30 VAC/DC, 30 Hz, 17 k Ω m, with internal connection to input (3)

Control Inputs

Enable Input (5) NPN, ≤ 28 VDC, level sensitive

Reset Input (4) NPN, ≤ 28 VDC, edge triggered, max. 30 Hz (50 % duty cycle)

Output (only 008)

SSR Relay Photomos relay, 0.1 A, 30 VAC/DC, reaction time < 5 ms

Relay Option Module Changeover contact 5 A, 120/240 VAC or 30 VDC

Physical

Mounting Front panel mounting with mounting bracket

Dimensions DIN 36 x 72 mm, 36 mm total depth, total width 83 mm

Panel Cutout $33^{+0,3}$ mm x $68^{+0,3}$ mm, depth behind panel < 29 mm

Environmental

Panel Thickness max. 8 mm

Front Panel Rating IP 65 / NEMA 4

Operating and Storage Temperature 0 $^{\circ}$ C to $+ 55$ $^{\circ}$ C

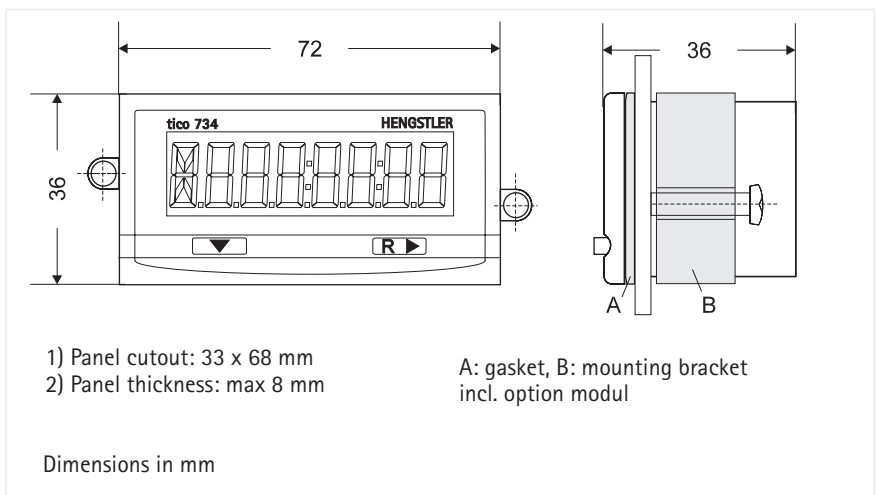
$- 20$ $^{\circ}$ C to $+ 60$ $^{\circ}$ C

General DIN EN 61010 part 1 / VDE 0411 part 1

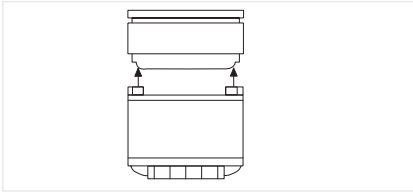
Protection according to class II, Contamination level 2

Overvoltage category II

DIMENSIONS



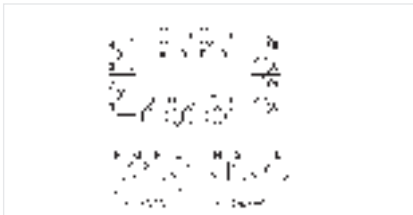
OPTION MODULES



FUNCTIONS OVERVIEW

TECHNICAL DATA

WIRING



ORDERING INFORMATION

With the Option Modules, the **tico 734** can be functionally extended and adapted to special application conditions. The following option functions are available:

- AC power supply providing sensor supply 10-20 VDC / 50 mA and 12 V supply for display backlighting (supports the battery in models with SSR output)
- Relay output, changeover contact, 5 A, 120/240 VAC or 30 VDC
- High voltage input (100..260 VAC/DC, max. 30 Hz, 200 KΩ)

1734 ...

| | Connections | 010 | 011 | 012 | 013 | 014 | 015 | 016 | 017 | 018 | 019 | 020 |
|-----------------------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| High Voltage Input | C-D | x | | x | x | | x | | | | | |
| Relay 1 x change over | A-B-J | | x | | x | | x | x | | x | | x |
| AC power Supply | E-F, G-H | | | x | | x | x | | | | x | x |
| Low Voltage Input | C-D | | | | | | | | x | x | x | x |

| | |
|--------------------------|---|
| Power Supply (E-H) | 115 VAC or 230 VAC (see wiring), frequency 50/60 Hz. Terminal (8) provides an unregulated 10-20 VDC supply for powering sensors up to 50 mA |
| Relay | Type: SPDT (Form C) mechanical relay; Operate Time: 6 ms |
| Output (A-B-J) | 5A, 120/240 VAC or 30 VDC, silver alloy Electrical Life: > 500 000 operations, Mechanical Life: > 10 million operations |
| High Voltage Input (C-D) | Voltage Range: 100 to 260 VAC or VDC Count Speed: max. 30 Hz. (duty cycle 50 %) Minimum Pulse Width: 12 ms; Impedance: 200 kOhm |
| Low Voltage Input (C-D) | Voltage Range: 5 to 30 VAC or VDC Count Speed: max. 30 Hz. (duty cycle 50 %) Minimum Pulse Width: 12 ms; Impedance: 17 kOhm |
| Mounting | Attaching on back of instrument |
| Dimensions | 42 x 69 mm, depth 58 mm, total depth behind panel with instrument 82 mm |
| Temperature | Operating: -0° C to +50° C; Storage -20° C to +60° C; |
| General | DIN EN 61010 part 1, Protection according to class II Contamination level 2; Overvoltage category II |

All modules contain 17 terminals. The exact functions that are present are determined by the model of instrument and option module (see Functions Overview).

1-8 Connection to instrument (refer to appropriate operating instructions)

- A Normally Open Relay Contact
- B Relay Common
- J Normally Closed Relay Contact
- C-D High or Low Voltage Input, no polarity, (provides NPN signal on terminal 3)
- E-F 115 VAC Line winding I
- G-H 115 VAC Line winding II

| Panel Instruments | |
|---|-----------|
| Totalizer | 0 734 000 |
| Add/Subtract Totalizer | 0 734 001 |
| Position Indicator | 0 734 002 |
| Tachometer | 0 734 003 |
| Programmable Rate Meter | 0 734 004 |
| Rate Meter with Totalizer | 0 734 005 |
| Elapsed Time Indicator | 0 734 006 |
| Preset Counter | 0 734 007 |
| Preset Timer | 0 734 008 |
| Rate Meter with Total and Pulsed Output | 0 734 009 |
| Lithiumbattery | E3533 355 |

| Option Modules | |
|----------------------|-----------|
| HV Input | 1 734 010 |
| Relay | 1 734 011 |
| AC Power | 1 734 012 |
| HV Input and Relay | 1 734 013 |
| HV Input and Power | 1 734 014 |
| Power and Relay | 1 734 015 |
| HV Input/Power/Relay | 1 734 016 |
| LV Input | 1 734 017 |
| LV Input and Relay | 1 734 018 |
| LV Input and Power | 1 734 019 |
| LV Input/Power/Relay | 1 734 020 |

Type 891

Time Counter with DIN

Dimensions for AC and DC Operation

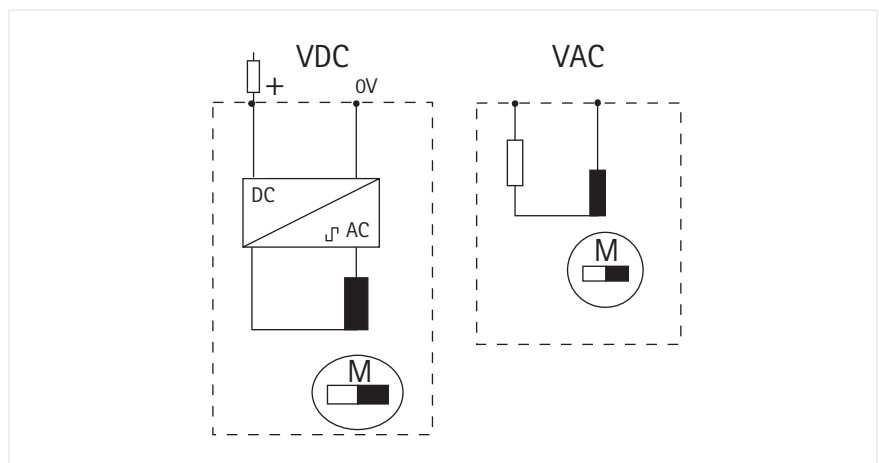


- Low-cost
- DIN dimensions 24 x 48 mm, 48 x 48 mm or 72 x 72 mm
- Highly legible display
- Simple installation
- No reset

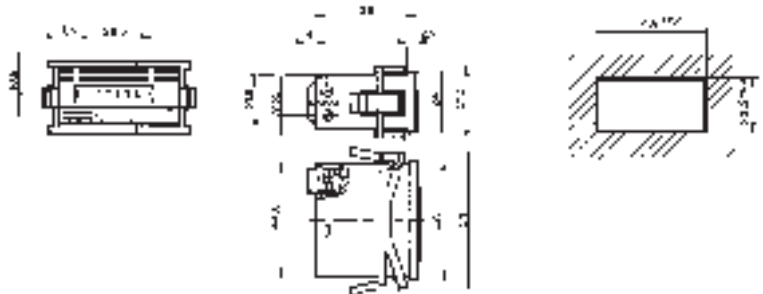
TECHNICAL DATA

| | |
|----------------------------|--|
| Display | 7-digit, 0 ... 99999.99 h |
| Digit height | 5 mm, visual |
| Supply voltage V_{op} | acc. to order information + 10 % (230 VAC + 15 %) |
| Power consumption | 0.7 VA or max 750 mW on DC |
| Operating temperature | - 10 ... + 50 °C |
| Storage temperature | - 20 ... + 70 °C |
| El. connection | screw terminals for cables of max. 2.5 mm ² and AMP connector 6.3 x 0.8 mm |
| Mounting | with clamping frame (Ordering code 2 891 016) |
| Mounting position | roller axis horizontal |
| Protection class (IEC 144) | front IP 66; screw terminals IP 20, AMP connectors IP 00 |
| Vibrostability | 30 m/s ² (10 ... 500 Hz) acc. to IEC 068-2-6 |
| Shock stability | 800 m/s ² (6 ms) acc. to IEC 068-2-27 |
| General design | acc. to DIN VDE, part 1, protection according to class II, Contamination level 2; Overvoltage category II |
| Weight | approx. 50 g |
| Approvals | UL: E 130453 (M), CSA (only AC version) |
| Reset | none |

CONNECTION DIAGRAM

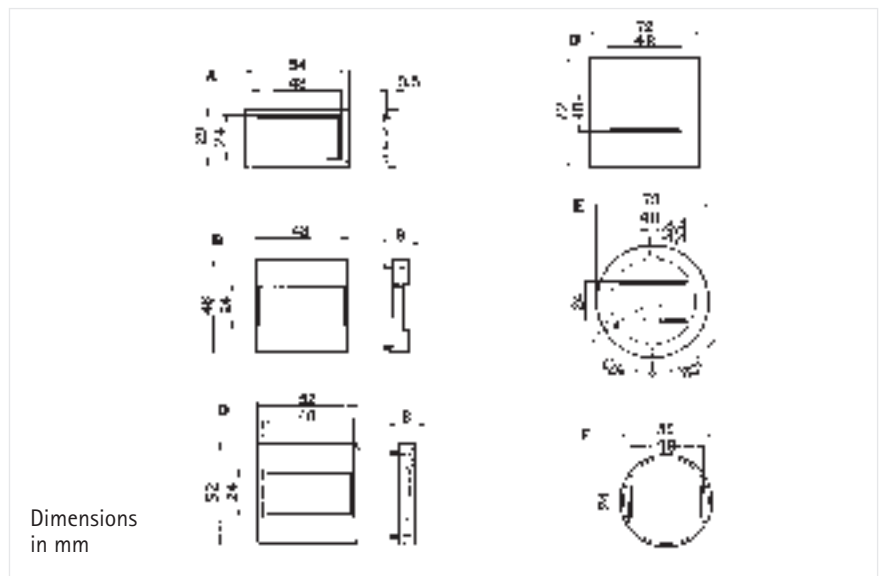


DIMENSIONS Counter



Seal: Ordering code 2 405 231 (0.5 mm)

Installation frame



ORDER INFORMATION Counter

| Voltage | Power consumption | 50 Hz Ordering code | 60 Hz Ordering code |
|---------|-------------------|------------------------|------------------------|
| 24 VAC | 0.1 VA | 0 891 201 | 0 891 202 |
| 115 VAC | 0.6 VA | 0 891 203 | 0 891 204 |
| 230 VAC | 0.7 VA | 0 891 211 | 0 891 206 |
| 100 VAC | 0,3 VA | 0 891 213 | 0 891 214 |
| 200 VAC | 0.7 VA | 0 891 215 | 0 891 216 |

| Voltage | Max. power consumption | Ordering code | external resistor |
|--------------|------------------------|---------------|-------------------|
| 12... 36 VDC | 350 mW | 0 891 331 | |
| 40... 60 VDC | 620 mW | 0 891 331 | + 6,8 kΩ/1 W |
| 80...125 VDC | 1100 mW | 0 891 331 | + 15 kΩ/1 W |

Installation frame

| | Size | Installation cutout | Frame Ordering code | Seal Ordering code |
|---|------------|---------------------|------------------------|-----------------------|
| A | 54 x 29 mm | 50 x 25 mm | 2 405 218 | 2 405 232 |
| B | 48 x 48 mm | 45 x 45 mm | 2 405 219 | 2 405 233 |
| C | 52 x 52 mm | ∅ 50 mm | 2 405 220 | 2 405 234 |
| D | 72 x 72 mm | 68 x 68 mm | 1 405 672 | 2 405 235 |
| E | ∅ 73 mm | ∅ 50 mm | 2 405 223 | 2 405 237 |
| F | ∅ 58 mm | ∅ 50 mm | 2 405 224 | 2 405 236 |

Time counters/
Timer relays

Type 891



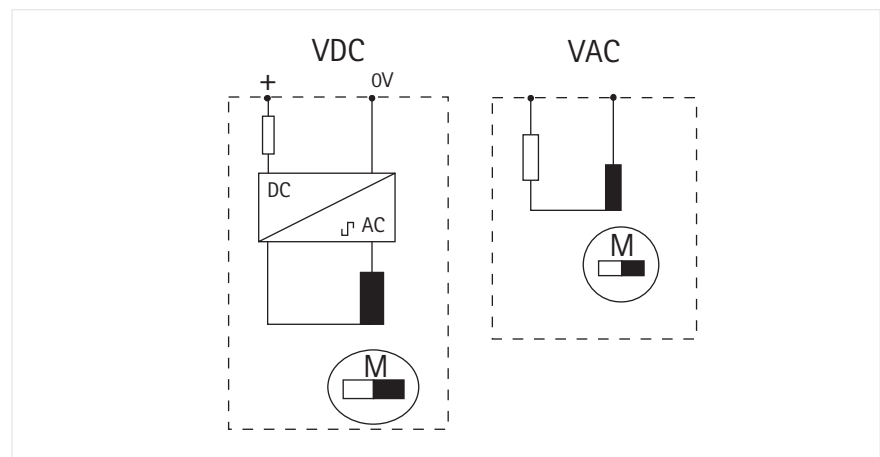
TECHNICAL DATA

Time Counter for Surface Mounting, Suitable for AC and DC Operation

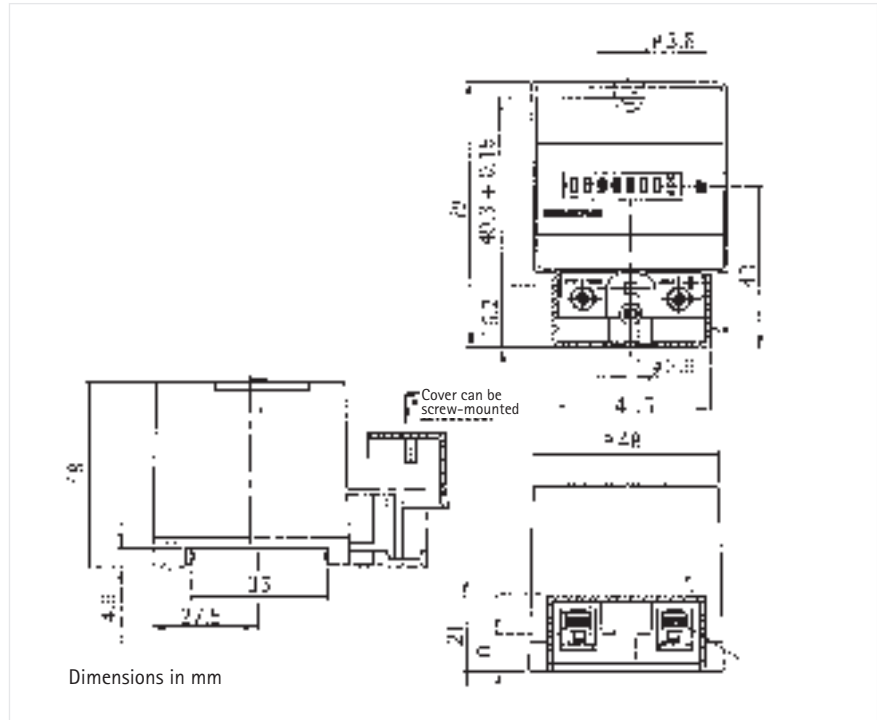
- Low-cost
- DIN rail attachment
- Highly legible display
- Simple installation
- No reset

| | |
|----------------------------|---|
| Display | 7-digit, 0 ... 99999.99 h |
| Digit height | 5 mm, visual |
| Supply voltage V_{op} | acc. to order information + 10 % (230 VAC + 15 %) |
| Power consumption | 0.7 VA on AC - 750 mW on DC |
| Operating temperature | - 10 ... + 50 °C |
| Storage temperature | - 20 ... + 70 °C |
| El. connection | screw terminals for cables of max. 2.5 mm ² and AMP connector 6.3 x 0.8 mm |
| Mounting | with screws or on DIN rail |
| Mounting position | roller axis horizontal |
| Protection class (IEC 144) | front IP 66; screw terminals IP 20, AMP connectors IP 00 |
| Vibrostability | 30 m/s ² (10 ... 500 Hz) acc. to IEC 068-2-6 |
| Shock stability | 800 m/s ² (6 ms) acc. to IEC 068-2-27 |
| General design | acc. to DIN VDE, part 1, protection according to class II, Contamination level 2; Overvoltage category II |
| Weight | approx. 50 g |
| Reset | none |

CONNECTION DIAGRAM



DIMENSIONS Counter



ORDER INFORMATION Counter

| Voltage | Power consumption | Voltage tolerance | Ordering code |
|-------------|-------------------|-------------------|---------------|
| 24 V 50 Hz | 0.1 VA | ± 10 % | 0 891 501 |
| 24 V 60 Hz | 0.1 VA | ± 10 % | 0 891 502 |
| 115 V 50 Hz | 0.6 VA | ± 10 % | 0 891 503 |
| 115 V 60 Hz | 0.6 VA | ± 10 % | 0 891 504 |
| 230 V 50 Hz | 0.7 VA | ± 15 % | 0 891 511 |
| 12- 36 V DC | max. 550 mW | ± 10 % | 0 891 531 |
| 40- 60 V DC | max. 50 mW | ± 10 % | 0 891 532 |
| 80-125 V DC | 750 mW | ± 10 % | 0 891 533 |

Type 478



TECHNICAL DATA

Plug-in Time Counters for Modular System 400

- 6 or 7-digit display
- With or without reset
- Simple installation
- Easy maintenance through plug-in system
- Can be combined with other counters in the modular system 400

| | |
|-----------------------------|--|
| Display | 6 or 7-digit, depending on version |
| Counting range | 0 ... 9999.99 h or 0 ... 99999.99 h, depending on version |
| Digit height | 4 mm |
| Supply voltage V_{op} | acc. to order information, tolerance + 10 % |
| Power consumption | approx. 1 VA |
| Operating temperature | - 10 ... + 50 °C |
| Storage temperature | - 20 ... + 70 °C |
| Protection class (EN 60529) | front IP 40, connections IP 00 |
| Vibrostability | 50 m/s ² acc. to IEC 068-2-6 |
| Shock stability | 600 m/s ² (6 ms) acc. to IEC 068-2-27 |
| General design | according EN 61010-1 |
| Contamination Level | 2 |
| Protection | according to class II |
| Overvoltage category | II |
| Reset | depending on version - manual reset with key or button - without reset |

CONNECTION DIAGRAM



Type 633-DC



Type 633.0

Time Counters mini "h", DC Version



Type 633.7



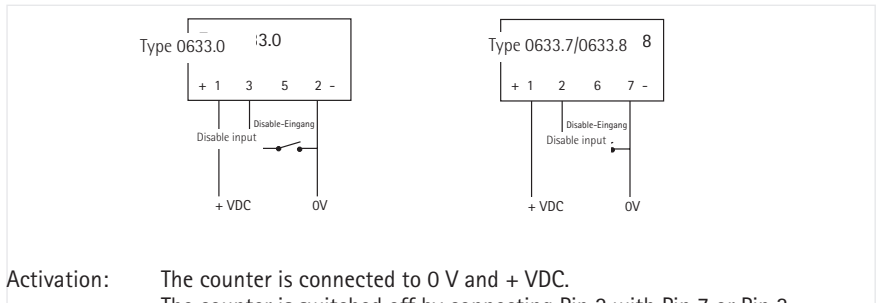
Type 633.8

- High shock resistance
- Miniature dimensions
- Low power consumption
- Electrical connections in standard grid
- Suitable for PCB mounting
- Machine-solderable and washable versions available
- Protection class IP 65

TECHNICAL DATA

| | |
|-----------------------------|--|
| Display | 7-digit, 0 ... 99 999.99 h |
| Digit height | 4 mm, visual |
| Supply voltage Vop | acc. to order information, tolerance + 10 % |
| Power consumption | approx. 30 mW |
| Residual ripple | < 1 % |
| Operating temperature | - 10 ... + 60 °C |
| Storage temperature | - 40 ... + 70 °C |
| El. connection | versions .0 solder pins, .7 and .8 wiring posts Ø 0.6 mm |
| Mounting | versions .0 on PCB, .7 with wiring posts, .8 with catch spring |
| Mounting position | horizontal figure wheel shaft |
| Protection class (DIN 4050) | IP 66, versions .7 and .8 only at front, connections IP 00 |
| Vibrostability | 30 m/s ² (10 - 500 Hz) acc. to IEC 068-2-6 |
| Shock stability | > 3500 m/s ² acc. to IEC 068-2-27 |
| General design | acc. to DIN VDE 0700; insulation group C (VDE 0110), protection class II |
| Weight | approx. 10 g |
| Time error | with disable per switching cycle 0.488 ms |
| Reset | none |

CONNECTION DIAGRAM



Type 633-DC



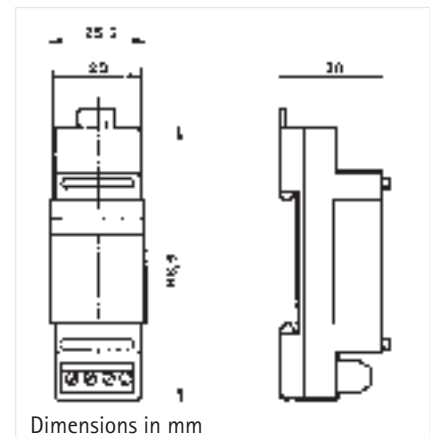
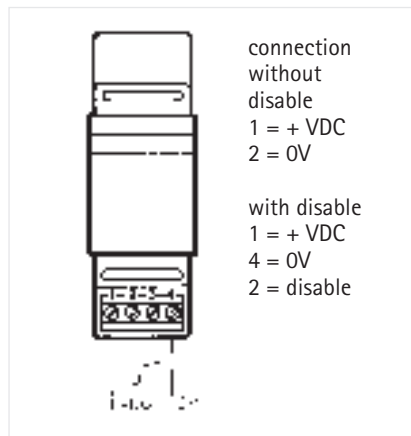
TECHNICAL DATA

Miniature Time Counter for 35 mm DIN Rail Attachment

- Miniature size
- Low power consumption
- Screw terminal connection
- Suitable for switch cabinet installation
- Snap-on attachment for 35 mm DIN rail

| | | |
|-----------------------------|--|---------|
| Display | 7-digit, 0 ... 99999.99 h | |
| Digit height | 4 mm, visual | |
| Supply voltage V_{op} | acc. to order information, tolerance + 10 % | |
| Current consumption | during pulse | voltage |
| | 35 mA | 5 VDC |
| | 17 mA | 12 VDC |
| | 9 mA | 24 VDC |
| Residual ripple | < 1 % | |
| Operating temperature | 0 ... + 60 °C | |
| Storage temperature | - 40 ... + 70 °C | |
| Protection class (DIN 4050) | IP 10 | |
| Vibrostability | 30 m/s ² (10 - 500 Hz) acc. to IEC 068-2-6 | |
| Shock stability | > 3500 m/s ² acc. to IEC 068-2-27 | |
| General design | acc. to DIN VDE 0700; insulation group C (VDE 0110), protection class II | |
| Weight | approx. 40 g | |
| Time error | with disable 0.488 ms per switching cycle | |
| Reset | none | |

CONNECTION DIAGRAM DIMENSIONS



ORDER INFORMATION

| | |
|--|-----------|
| Time counter for supply voltage 5 VDC | 0 633 531 |
| Time counter for supply voltage 12 VDC | 0 633 532 |
| Time counter for supply voltage 24 VDC | 0 633 533 |

Time Counter mini "h", Type 633-AC

AC Version

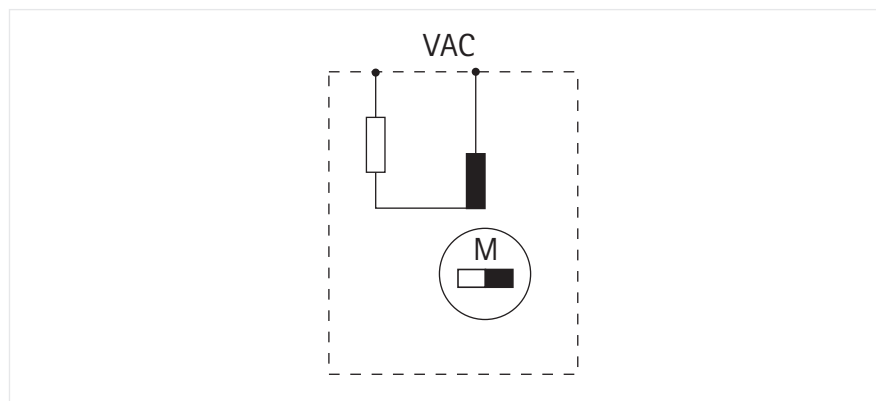


TECHNICAL DATA

- Miniature dimensions
- Low power consumption
- Quiet operation
- Protection class IP 65

| | |
|-----------------------------|--|
| Display | 6-digit, 0 ... 99999.9 h |
| Digit height | 4 mm, visual |
| Supply voltage Vop | acc. to order information, tolerance + 10 % |
| Power consumption | 24 V 0.08 VA, 115 V 0.56 VA, 220 V 1 VA |
| Operating temperature | - 10 ... + 50 °C |
| Storage temperature | - 25 ... + 70 °C |
| Humidity | 75 %, without condensation |
| El. connection | depending on version screw terminal connection for cables up to 2.5 mm ² or 250 mm long connecting cable, AWG 28 or AMP 2.8 x 0.8 mm |
| Mounting | with clamping frame |
| Mounting position | horizontal figure wheel shaft |
| Protection class (DIN 4050) | Version .8: front IP 66, connections IP 40 (touchproof) |
| Vibro stability | 30 m/s ² (10 - 500 Hz) acc. to IEC 068-2-6 |
| Shock stability | 800 m/s ² (6 ms) acc. to IEC 068-2-27 |
| General design | acc. to DIN VDE 0700; insulation group C (VDE 0110), protection class II |
| Noise level | approx. 40 dB (distance 25 cm) |
| Reset | none |

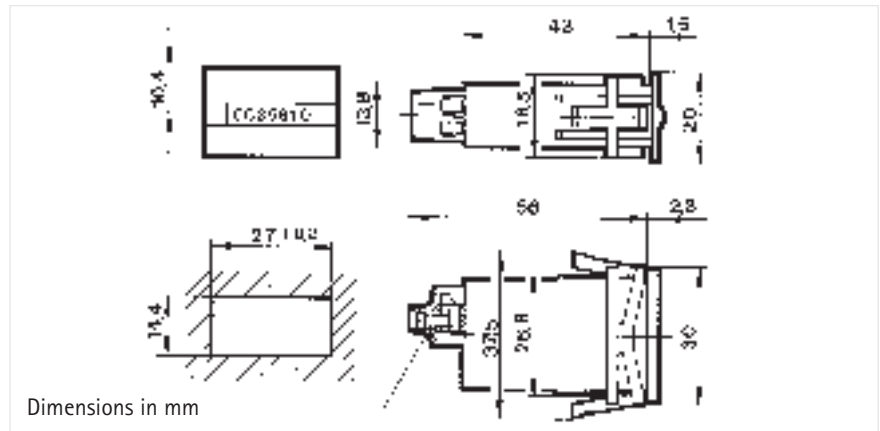
CONNECTION DIAGRAM



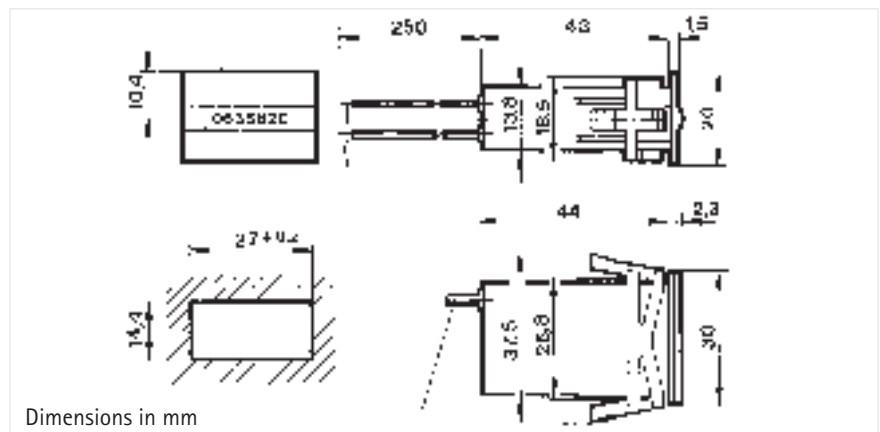
Type 633-AC

Technical data

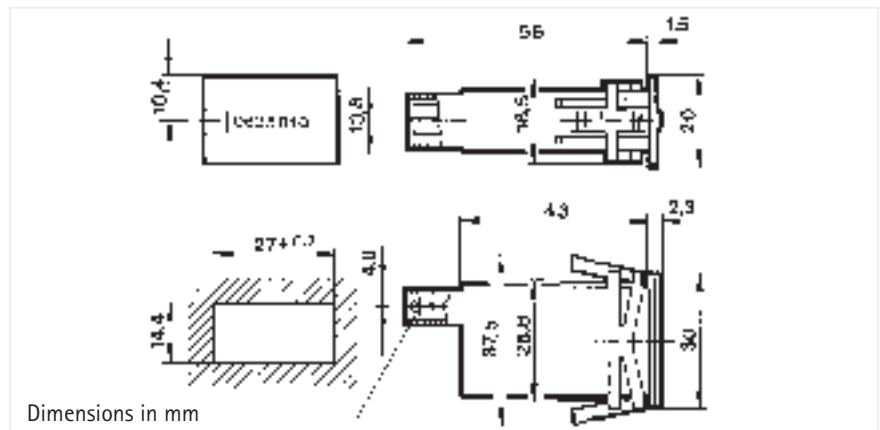
DIMENSIONS Screw terminals



Connecting cable



AMP connector



ORDER INFORMATION

Counter

| Voltage | Screw terminals | Connecting cable |
|-------------|-----------------|------------------|
| 24 V 50 Hz | 0 633 811 | 0 633 821 |
| 115 V 50 Hz | 0 633 813 | 0 633 823 |
| 115 V 60 Hz | 0 633 814 | 0 633 824 |
| 220 V 50 Hz | 0 633 815 | 0 633 825 |

Other voltages on request

Accessories

panel frame 24x36 mm (insert dimensions 22 x 36 mm) Ordering code 1 405 674

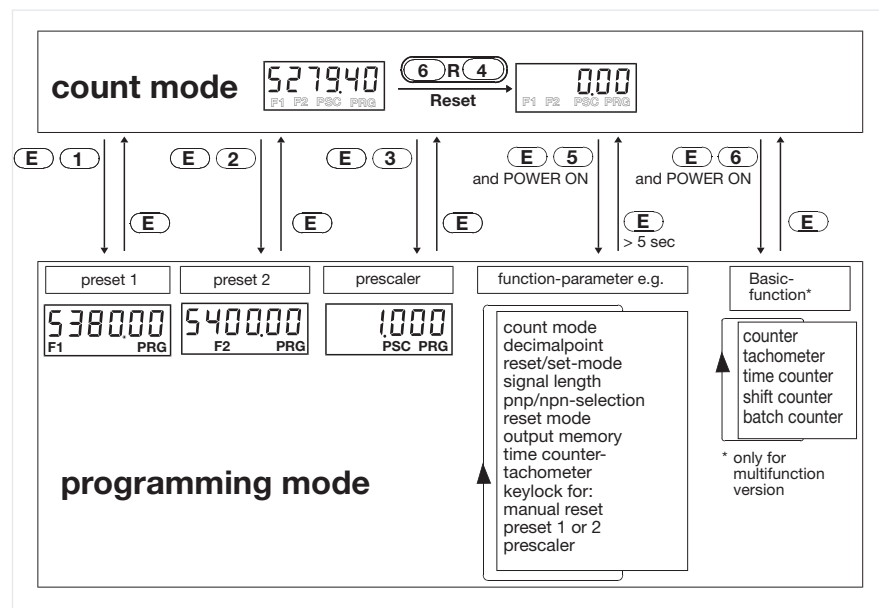
Bi-directional Multifunction-Counter

tico 732



- high-contrast LED or LCD-Display, 6 digits
- small and compact DIN dimensions 48 x 48 mm
- easy operation by one key per digit
- direct access to parameters
- available with 1 or 2 presets
- transistor and relay with changeover contact, for each preset
- with integrated separate totalizer
- 5 basic functions easily programmable: counter, tachometer, time counter, shift counter and batch counter
- display range from - 99999 to 999999

PROGRAMMING



The important values, preset 1, preset 2, prescaler and separate totalizer can be directly selected. It is necessary only to press the relevant button and the E-button together. To make the operation still more easy, access to those values can be locked separately. All other system parameters like operation and count modes are laid down in a common operation level. These parameters are usually programmed once only during the first initiation.

TECHNICAL DATA

General

| | |
|----------------------------|---|
| Display | LED or LCD, 6 digits, leading zero suppression, decimal point |
| Digit height | LED 7.6 mm; LCD 9 mm |
| Supply voltage | 12...24 VDC; 24 VAC; 115 VAC; 230 VAC; 50/60 Hz, depending on version |
| Current consumption | 12...24 VDC < 150 mA 100/115/230 VAC < 50 mA; including sensor supply |
| Sensor supply | only when AC operated: 12 ... 30 VDC, max 50 mA |
| Data retention | non-volatile memory > 10 years |
| Operating temperature | 0 ... +50 °C |
| Storage temperature | - 20 ... + 70 °C |
| Electrical connection | screw terminals |
| Mounting | with clamping frame |
| Protection class (IEC 144) | front side IP 65, terminals IP 20 |
| Vibro stability | 10 m/s ² (10...150 Hz) according to IEC 68-T2-6 |
| Shock stability | 100 m/s ² (18 ms) according to IEC 68-T2-27 |
| General rating | according to VDE 0411, DIN 57411, protection class II |
| Approvals | UL + CUL E 96337 |
| Amplitude thresholds | < 2 V and > 8 V or < 2 V and > 3.8 V with TTL level, max 40 VDC |
| Active edge | programmable; positive with pnp input; negative with npn input |
| Pulse shape | any (squarewave 1:1 for max. frequency) |
| Input resistance | approx. 10 kOhm (static) |
| Counting frequency | max. 5 kHz (2.5 kHz bi-directional) |
| Prescaler | programmable from 0.001 to 9.999 (999.999) |
| Count inputs A, B | - phase discriminator with single evaluation - differential mode (add/sub) - count direction mode - totalizing mode (add/add) |
| Pulse length min. | 17 ms (30 Hz), 100 µs (5 kHz) |
| Control input C | - manual reset possible - external reset, static or dynamic, programmable, pulse length > 5 ms - automatic reset when main preset has been reached (programmable) |
| Relay | changeover contact max. 250 VAC / 30 VDC, min. 5 V AC/DC max. 1 A, min. 10 mA, delay < 5 ms |
| Transistor | pnp output 12...24 VDC max 10 mA of DC supply; 12...30 V DC max. 10 mA of AC supply |
| Tacho | |
| Method | time interval (1/Tau) |
| Display range | 1/min or 1/sec |
| Min input frequency | 0.125 Hz = 8 sec |
| Alarms | 2 alarms with programmable start-up-suppression |
| Time bases | programmable; sec, min., h or hh.mm.ss |
| Resolution | programmable 1; 0.1; 0.01; 0.001 (on sec = 1 ms) |
| Function | single pulse measurement (short time meter) or cumulated counting (hour meter) |
| Count mode | pulse width or period measurement (start-stop) |

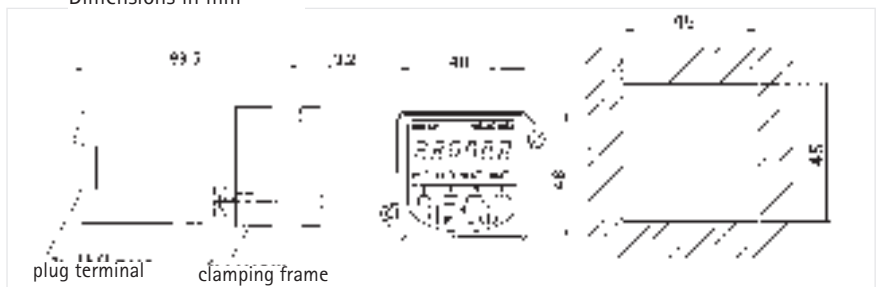
Counter

Tacho

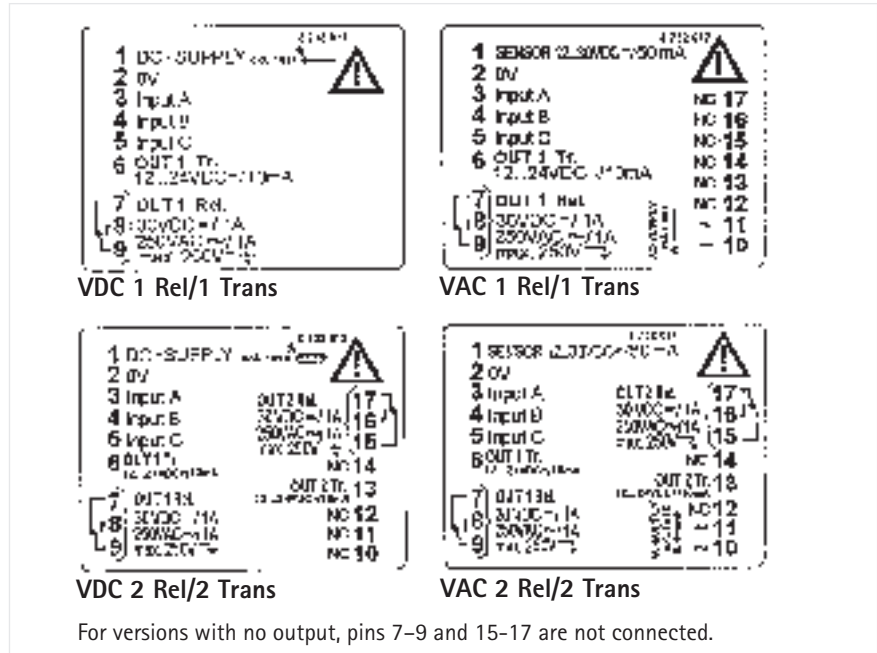
Time-counter

DIMENSIONS

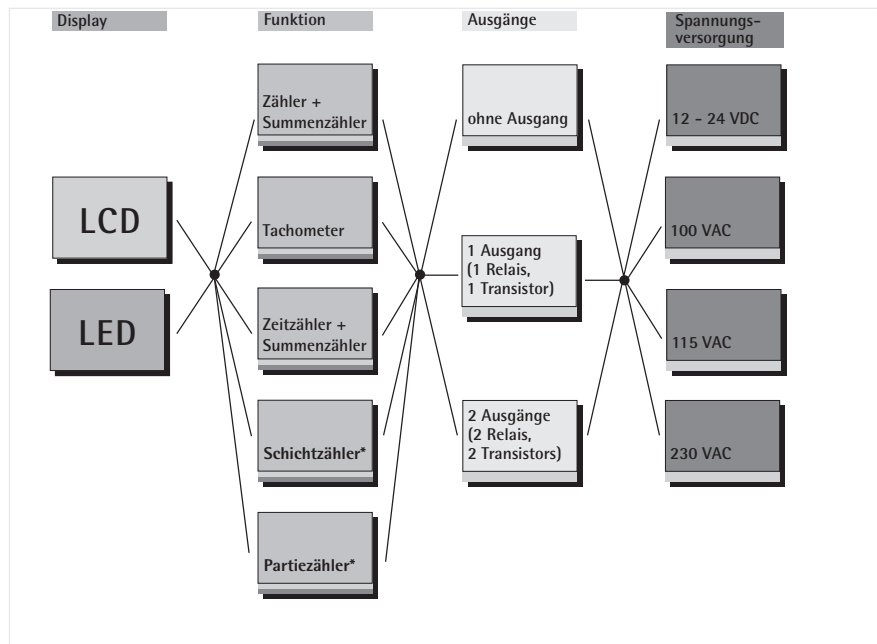
Dimensions in mm



CONNECTING DIAGRAM



POSSIBLE VARIANTS



Time counters/
Timer relays

Multifunctional version: Article No.: 0 732 0 B

ORDER INFORMATION

| Display | Preset | 12-24 VDC | 24 VAC | 115 VAC | 230 VAC |
|---------|--------|-----------|-----------|-----------|-----------|
| LCD | - | 0 732 000 | 0 732 071 | 0 732 037 | 0 732 001 |
| LCD | 1 | 0 732 002 | 0 732 073 | 0 732 039 | 0 732 003 |
| LCD | 2 | 0 732 012 | 0 732 078 | 0 732 049 | 0 732 013 |
| LED | - | 0 732 018 | 0 732 080 | 0 732 055 | 0 732 019 |
| LED | 1 | 0 732 020 | 0 732 082 | 0 732 057 | 0 732 021 |
| LED | 2 | 0 732 030 | 0 732 087 | 0 732 067 | 0 732 031 |

Important: only versions with 2 presets or without preset can be used as tachometers.

tico 734



MODEL OVERVIEW

Elapsed Time Indicator (0 734 006)

6 digit, display format: 999999s, 99999.9m, 99999.9h, hh:mm:ss, reset key can be enabled/disabled

Preset Timer (0 734 008)

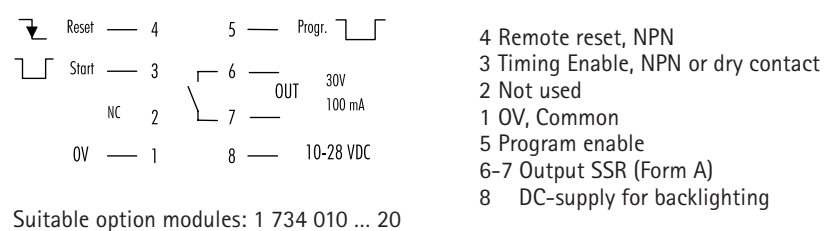
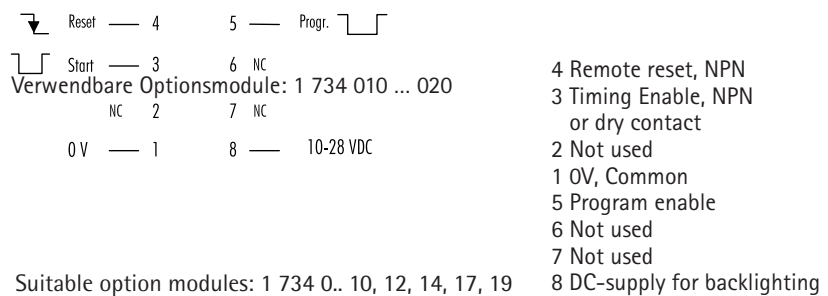
6 digit, display format: 999999s, 99999.9m, 99999.9h, hh:mm:ss, programmable for up or down counting, SSR output programmable for on-delay or interval, reset key can be enabled/disabled, preset lock function

Flexible Counter Series in DIN size 36 x 72 mm

- LCD display, 8 digits, 12 mm height, excellent contrast through
- Backlighting with a 10-28 VDC supply
- Lithium battery power supply
- Decimal point, input scaling, count direction, output mode, etc. programmable, depending on model
- Programming reduced to a minimum for easy handling and set-up
- CE approval, IP 65, NEMA 4
- Suitable for TTL
- Mounting depth 29 mm

The family **tico 734** consists of ten models:

| | |
|-----------|--|
| 0 734 000 | Totalizer without scaling |
| 0 734 001 | Add/Subtract totalizer |
| 0 734 002 | Position indicator |
| 0 734 003 | Tachometer |
| 0 734 004 | Programmable rate meter |
| 0 734 005 | Rate meter with totalizer |
| 0 734 006 | Time counter |
| 0 734 007 | Preset counter |
| 0 734 008 | Time preset counter |
| 0 734 009 | Rate meter 005; with total and pulsed output |



Power Supply

Internal Single or dual lithium 3 V battery (CR 1/2 AA), typical life time of 5 years (10 yrs w/2 batteries). „Lo BAT" display flashes approximately 2 weeks prior to end of battery life.

Display

via Option Module 120/240 VAC provides 12 VDC for display backlighting

Display LCD, 12 mm height, 8 digits

Backlighting Whole display area can be backlit with a 10-28 VDC supply, green-yellow colour

Count Inputs

High Speed Input (2) PNP, ≤ 28 VDC, max. 10 kHz (50% duty cycle), Low < 1.0 V, High > 2.0 V, impulse > 45 μ s, impedance 1 M Ω

Low Speed Input (3) NPN, ≤ 28 VDC, max. 30 Hz (50% duty cycle), Low < 1.0 V, High > 2.0 V, impedance 1 M Ω

High Voltage Option Module 100..260 VAC/DC, 30 Hz, 1 M Ω , with internal connection to input (3)

Low Voltage Option Module 5..30 VAC/DC, 30 Hz, 17 k Ω , with internal connection to input (3)

Control Inputs

Enable Input (5) NPN, 28 VDC, level sensitive

Reset Input (4) NPN, 28 VDC, edge triggered, max. 30 Hz (50% duty cycle)

Output (only 008)

SSR Relay Photomos relay, 0.1 A, 30 VAC/DC, reaction time < 5 ms

Relay Option Module Changeover contact 5 A, 120/240 VAC or 30 VDC

Physical

Mounting Front panel mounting with mounting bracket

Dimensions DIN 36 x 72 mm, 36 mm total depth, total width 83 mm

Panel Cutout $33^{+0,3}$ mm x $68^{+0,3}$ mm, depth behind panel < 29 mm

Panel Thickness max. 8 mm

Environmental

Front Panel Rating IP 65 / NEMA 4

Operating and Storage Temperature 0 $^{\circ}$ C to $+ 55$ $^{\circ}$ C

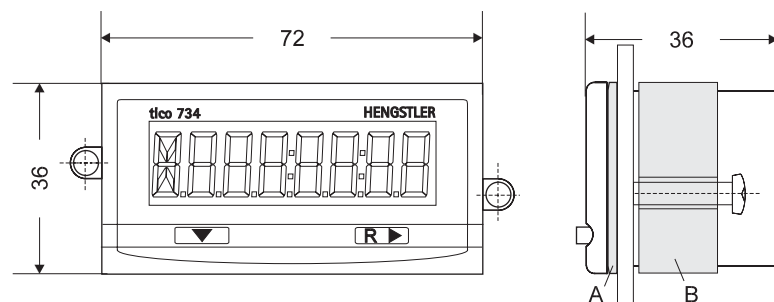
$- 20$ $^{\circ}$ C to $+ 60$ $^{\circ}$ C

General DIN EN 61010 part 1 / VDE 0411 part 1

Protection according to class II, Contamination level 2

Overvoltage category II

DIMENSIONS



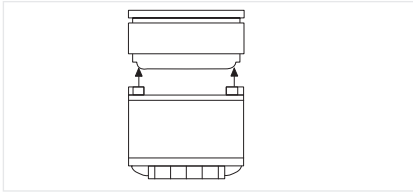
- 1) Panel cutout: 33 x 68 mm
- 2) Panel thickness: max 8 mm

A: gasket, B: mounting bracket incl. option modul

Dimensions in mm

tico 734

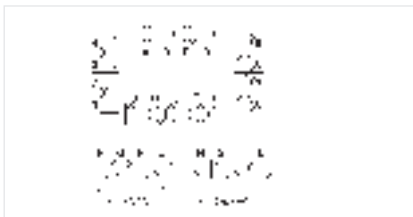
OPTION MODULES



FUNCTIONS OVERVIEW

TECHNICAL DATA

WIRING



ORDERING INFORMATION

Technical data

With the Option Modules, the **tico 734** can be functionally extended and adapted to special application conditions. The following option functions are available:

- AC power supply providing sensor supply 10-20 VDC / 50 mA and 12 V supply for display backlighting (supports the battery in models with SSR output)
- Relay output, changeover contact, 5 A, 120/240 VAC or 30 VDC
- High voltage input (100..260 VAC/DC, max. 30 Hz, 200 KΩ)

1734 ...

| | Connections | 010 | 011 | 012 | 013 | 014 | 015 | 016 | 017 | 018 | 019 | 020 |
|-----------------------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| High Voltage Input | C-D | x | | x | x | | x | | | | | |
| Relay 1 x change over | A-B-J | | x | | x | | x | x | | x | | x |
| AC power Supply | E-F, G-H | | | x | | x | x | x | | | x | x |
| Low Voltage Input | C-D | | | | | | | | x | x | x | x |

| | |
|--------------------------|--|
| Power Supply (E-H) | 115 VAC or 230 VAC (see wiring), frequency 50/60 Hz. Terminal (8) provides an unregulated 10-20 VDC supply for powering sensors up to 50 mA |
| Relay Output (A-B-J) | Type: SPDT (Form C) mechanical relay; Operate Time: 6 ms 5A, 120/240 VAC or 30 VDC, silver alloy Electrical Life: > 500 000 operations, Mechanical Life: > 10 million operations |
| High Voltage Input (C-D) | Voltage Range: 100 to 260 VAC or VDC Count Speed: max. 30 Hz. (duty cycle 50 %) Minimum Pulse Width: 12 ms; Impedance: 200 kOhm |
| Low Voltage Input (C-D) | Voltage Range: 5 to 30 VAC or VDC Count Speed: max. 30 Hz. (duty cycle 50 %) Minimum Pulse Width: 12 ms; Impedance: 17 kOhm |
| Mounting | Attaching on back of instrument |
| Dimensions | 42 x 69 mm, depth 58 mm, total depth behind panel with instrument 82 mm |
| Temperature | Operating: -0° C to +50° C; Storage -20° C to +60° C; |
| General | DIN EN 61010 part 1, Protection according to class II Contamination level 2; Overvoltage category II |

All modules contain 17 terminals. The exact functions that are present are determined by the model of instrument and option module (see Functions Overview).

1-8 Connection to instrument (refer to appropriate operating instructions)

| | |
|-----|---|
| A | Normally Open Relay Contact |
| B | Relay Common |
| J | Normally Closed Relay Contact |
| C-D | High or Low Voltage Input, no polarity, (provides NPN signal on terminal 3) |
| E-F | 115 VAC Line winding I |
| G-H | 115 VAC Line winding II |

| Panel Instruments | |
|---|------------------|
| Totalizer | 0 734 000 |
| Add/Subtract Totalizer | 0 734 001 |
| Position Indicator | 0 734 002 |
| Tachometer | 0 734 003 |
| Programmable Rate Meter | 0 734 004 |
| Rate Meter with Totalizer | 0 734 005 |
| Elapsed Time Indicator | 0 734 006 |
| Preset Counter | 0 734 007 |
| Preset Timer | 0 734 008 |
| Rate Meter with Total and Pulsed Output | 0 734 009 |
| Lithiumbattery | E3533 355 |

| Option Modules | |
|----------------------|-----------|
| HV Input | 1 734 010 |
| Relay | 1 734 011 |
| AC Power | 1 734 012 |
| HV Input and Relay | 1 734 013 |
| HV Input and Power | 1 734 014 |
| Power and Relay | 1 734 015 |
| HV Input/Power/Relay | 1 734 016 |
| LV Input | 1 734 017 |
| LV Input and Relay | 1 734 018 |
| LV Input and Power | 1 734 019 |
| LV Input/Power/Relay | 1 734 020 |

Flexible Counter Series, **tico 735** Dual Colour Display, in DIN size 48 x 96 mm



FEATURES

COUNTING - MEASURING - INDICATING - MONITORING - TRANSMITTING

Because of the unlimited number of measurements it can handle, the **tico 735** device family is equally well suited to applications in the world of impulse and time counting as to those in the processing area.

If you are looking for display clarity and high levels of accuracy, then the **tico 735** is the right choice for you. The dual-colour display is unique, highlighting an alarm situation or an excess value at a single glance. You can program your own choice of display colour to indicate normal or alarm conditions.

- Brilliant 18.5 mm high dual-colour red/green LED display with programmable colour settings
- As standard, all models have limit or preset values
- Scaling available as standard
- Universal Power Supply 90...264 V AC or 20...50 V AC/DC
- Simple structured operation with switchable help function

- External Program Lockout
- DIN housing 48 x 96 mm, mounting depth < 100 mm
- Conveniently sized Screw Terminals
- Large keys offer safety and ease of operation

- NPN and Relay Outputs
- Option: RS 485 ASCII protocol serial interface for all versions. "Remote Display" version receives process values over RS 485

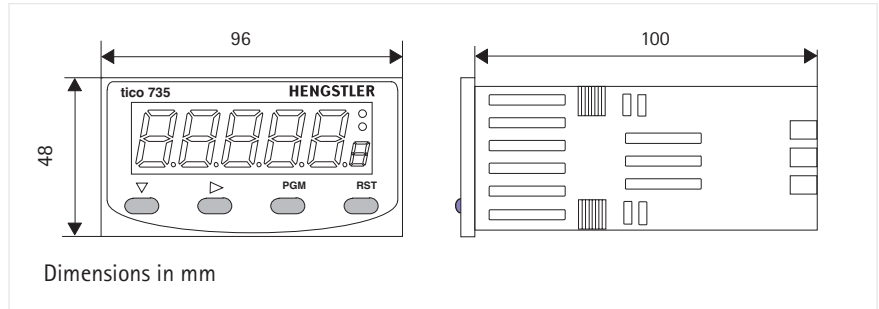
TIME PRESET COUNTER

| | |
|---|---|
| Time formats programmable (minimum time 0.1 Sec) | 9999.9 s, 9999.9 m, 9999.9 h, mmm:ss, hhh:mm |
| Time Preset with Output Signal | 0...99999 |
| Count Direction up/down | 0 -> P 1, P 1 -> 0 |
| Count Mode | Single, Accumulating |

tico 735

Technical data

DIMENSIONED DRAWINGS



DISPLAY AND KEYBOARD

| | |
|-------------------|--|
| Primary Display | Red/Green, 7 segment LED, 5 digits, height 18.5 mm |
| Secondary Display | single digit 7 segment LED, height 7 mm, red/green |
| Output Indicators | 2 red LED indicators for OUT 1 and OUT 2 status |
| Keyboard | 4 rubber keys for programming and manual reset |

PHYSICAL

| | |
|------------------|--|
| Front Dimensions | DIN 48 mm x 96 mm, 110 mm total depth |
| Mounting | Front panel mounting (mounting bracket supplied) |
| Panel Cutout | 45 mm x 92 mm, panel thickness max 12 mm |
| Construction | Front carrier with PCBs can be pulled out |
| Terminals | Screw Type (combination head) |

OPERATING CONDITIONS

| | |
|-------------------|--|
| Power Supply | 90 - 264 V AC 50/60 Hz (electrically separated from all inputs and outputs) or 20...50 V AC / 22...55 V DC |
| Temperature | Operation: 0 °C to +55 °C (32 °F to 131 °F) Storage: -20 °C to +60 °C (-4 °F to 176 °F) |
| Relative Humidity | 0 to 90 %, non-condensing |

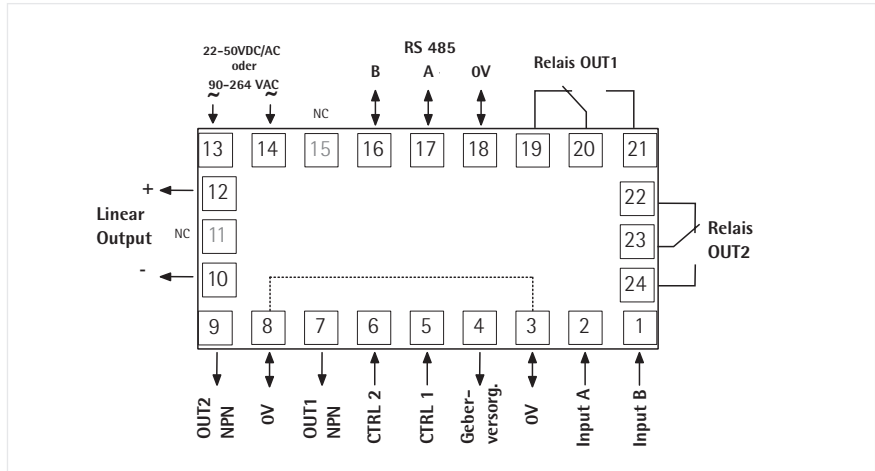
APPROVALS

| | |
|------------------|---|
| Protection class | Frontpanel IP 66 |
| CE | EN 50082-1/92-95; EN 50081-1/92, -2/94 |
| Safety | DIN EN 61010 part 1; protection according to class II |
| General | UL, CUL, Overvoltage cat. II, Contamination level 2 |

OPTION RS 485

| | |
|------------|---|
| Type | RS 485, serial asynchronous, Open ASCII, Master-Slave, up to 99 zones |
| Parameters | 9600...1200 Bd, 1 start, 7 data, 1 stop, even parity |

TERMINALS



COUNT INPUTS

| | |
|----------------------|---|
| Active Edge with PNP | NPN or PNP programmable; capable of TTL; 30 V DC max High ≥ 3.0 V, Low < 2.0 V or open; 10 kOhm to 0 V |
| with NPN | High ≥ 3.0 V or open, Low < 2.0 V; 4.7 kOhm to V+ |
| Frequency | 20 Hz, 200 Hz or 10 kHz programmable |

CONTROL INPUTS

| | |
|---------------------------|--|
| CTRL 1 (Reset) | NPN; High ≥ 3.0 V or open, Low < 2.0 V; 4,7 kOhm to V+ edge sensitive; 25 ms min., max 30 V DC |
| CTRL 2 (Progr. security)) | NPN; High ≥ 3.0 V or open, Low < 2.0 V; 4,7 kOhm to V+ level sensitive; 25 ms min.; max 30 V DC |

OUTPUTS

| | |
|------------------------|---|
| OUT 1 NPN | NPN, open collector; 30 V DC max; 100 mA max response time $< 75 \mu\text{s}$ |
| Relay 1, | Changeover (Form C); 240 V AC / 3A or 110 V AC / 5 A; pull-in time 8 ms |
| Auxiliary Power Supply | 9...15 (unregulated V DC), 125 mA max; residual ripple < 0.5 V |

SPECIAL FEATURES

- Display colour programmable
- Preset Lockout and Reset Disable programmable
- Program Security via CTRL 2
- Scaling available as standard

ORDERING DATA

Type 0735 P

Output Relay 2
 0 none
 1 with Relay 2 not for function 1, 6, 7

Interface
 0 none
 5 with RS 485

Function
 1 Totaliser
 2 Position Indicator
 4 Tacho/Rate Meter
 5 Rate + Totaliser
6 Time Counter
 7 1 Preset Counter
 8 2 Preset Counter
 9 Batch Counter

Linear Output
 0 none
 3 with 4-20 mA (only with function 2, 4, 5)

Power Supply
 0 90...264 V AC
 2 20...50 V AC or
 22...55 V DC

Option module
 RS 485 interface

Ordering code
 1 901 004

Example ordering code: 0 7 3 5 P

Time counters/
Timer relays

Type 489



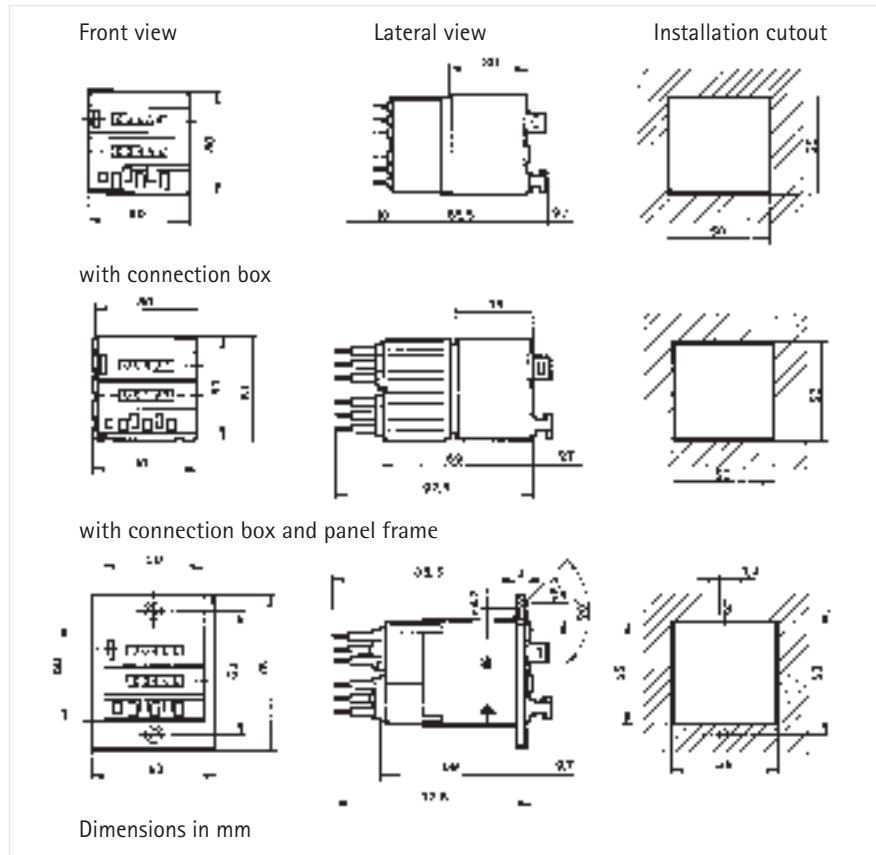
TECHNICAL DATA

Plug-in Electromechanical Preset Time Counters

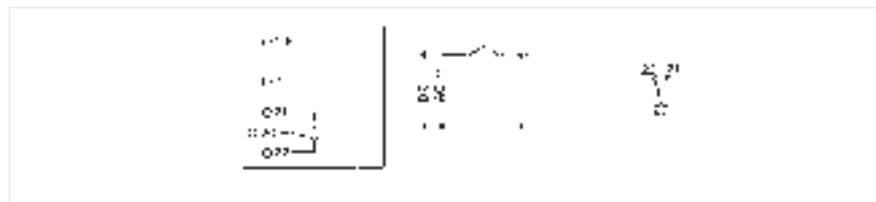
- Preset value continuously visible
- Manual reset
- Resolution 0.1 h
- Plugs into modular system 400

| | |
|----------------------------|---|
| Display | 5-digit indication of count and preset value, 9999.9 h |
| Digit height | 4 mm |
| Supply voltage V_{op} | see ordering code table, tolerance + 10 % |
| Power consumption | counter: 1 VA/W |
| Operating temperature | - 10 ... + 50 °C |
| Storage temperature | - 20 ... + 85 °C |
| Electrical connection | AMP connector, 0.8 x 2.8 mm (via connection box) |
| Mounting | modular system 400 |
| Mounting position | roller axis horizontal |
| Protection class (IEC 144) | front IP 40, connections IP 00; for higher degree of protection we recommend a protective case with transparent cover (see "Accessories") |
| General design | acc. to DIN VDE 0700 |
| Reset | manual with button |
| Reset frequency | DC version max. 1 per s, AC version max. 1 per 2 s |
| Signal output | changeover contact, floating |
| Signal duration | from when preset has been reached until reset |
| Switching voltage | max. 220 VAC |
| Switching current | max. 20 VA/1 A, non-inductive |

DIMENSIONED DRAWINGS



CONNECTION DIAGRAM



ORDER INFORMATION

Counter

| Voltage | Display 9999.9 h Ordering code |
|-------------|-----------------------------------|
| 24 V/50 Hz | 0 489 101 |
| 115 V/50 Hz | 0 489 103 |
| 220 V/50 Hz | 0 489 105 |
| 24 V/60 Hz | 0 489 102* |
| 220 V/60 Hz | 0 489 106* |
| 24 VDC | 0 489 121 |

Standard accessories

| | |
|------------------|---------------------------------------|
| Key reset system | Ordering code + SR e. g. 0 489 101 SR |
| Panel frame | 1 405 492 |
| Connection box | 1 405 537 |

* on request

Notes