tico 772/773/774

Multifunctional counter   tico 772/773/774

■ Universally applicable as a tachometer, timer, shift counter, batch counter ...
■ Easy to operate
■ Four different backlight colours
■ Intensity of backlighting can now be adjusted
■ Large, clearly readable 48 x 48 mm display
■ Input frequency up to 60 kHz
■ Easy installation via plug-in terminals
■ Three presets

TECHNICAL DATA

GENERAL

Display	LCD reflective, Transflective positive: black figures on backlit background Transmissive negative: white, red or green figures on backlit ground, 2 lines, 6-digit counter readings & presets; leading zero suppression, decimal point (up to 4 decimal places)
Digit height	1st line 9.3 mm; 2nd line 7.2 mm
Supply voltage	SELV: 12–30 VDC; reverse polarity protected SELV: 24 VAC, 50/60 Hz ± 10% 115 VAC; 230 VAC, 50/60 Hz ± 10% 100-240 VAC 50/60 Hz ± 10% with switch-mode power supply
Current consumption	12-30 VDC <200 mA, 12-30 VDC <250 mA with backlight 24 VAC <250 mA; including sensor supply 115/230 VAC <50 mA; including sensor supply 90 VAC max. 80 mA; including sensor supply with switch-mode power supply
Power consumption	<5 W <8 W with switch-mode power supply
Duty cycle	100%
Overload protection	External fuse DC: 0.16 AT (IEC 127); DC: 0.2 AT (UL 198) 24 VAC: 315 mAT; 230 VAC: 32 mAT; 115 VAC: 63 mAT
Overload protection Relay outputs	External fuse 230 V, 2.5 mAT DC: 0.16 AT (IEC 127); DC: 0.2 AT (UL 198) 24 VAC: 315 mAT 230 VAC: 32 mAT; 115 VAC: 63 mAT
Sensor supply	Transformer: AC operation: 12-24 VDC (load dependent), max. 50 mA Switch-mode power supply: AC operation: 24 VDC/-5%, max. 115 mA max. capacitive load = 470 µF
Data storage	Non-volatile memory >10 years
Electrical connection	Plug-in screw-type connections/terminals
Wire cross-section	1-1.5 mm² with wire-end sleeves

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Amplitude threshold	<2 V and >8 V or <1 V and >4 V at TTL level, Amplitude max. 40 VDC
Active edge	Programmable positive for PNP input, negative for NPN input
Input resistance	Approx. 10 kOhm
Count frequency	Max. 60 kHz; 30 Hz attenuated max. 20 kHz; 30 Hz attenuated in TTL operation Application input max. 6 kHz/30Hz attenuated To prevent the maximum input frequency of 60 kHz being exceeded, the following maximum input frequencies apply: Phase discriminator, single evaluation: A and B, each 30 kHz (20 kHz) TTL Phase discriminator, double evaluation: A and B, each 30 kHz (20 kHz) TTL Phase discriminator, quad evaluation: A and B, each 15 kHz (15 kHz) TTL Single-channel metering & directional input: input A 60 kHz (20 kHz) TTL Differential metering, totalizing: input A + B 60 kHz (20 kHz) TTL If the application input is also used as a metering input: Single-channel metering & directional input: input A + app. input 60 kHz (20 kHz) TTL Differential metering, totalizing: input A + B + app. input 60 kHz (20 kHz) TTL *->refer to graph on Page 5*
Pulse wave shape	Any (at max. frequency, square 1:1)
Pulse duration min.	17 ms (30 Hz); 8 µs (60 kHz)
Prescaler	0.0001–99.9999
Reset	Manual reset via keyboard, external static or dynamic reset, min. pulse length 5 ms, automatic reset after reaching Preset 2. No pulse losses at max. counter frequency due to automatic reset function. Via programmable application input and programmable power-on reset
Set function	Setting to Preset 0 (independent of reset)
Display and preset range	-999,999 to +999,999
Alarm signal	Display flashes when preset 0, 1 or 2 is active
Signal times	0.01 s to 599.99 s or bistable programming; tolerance $\pm$ 10 ms; active on or off
Relay (Presets 1 and 2)	Change-over contact max.: 250 VAC/30 VDC/5 A Change-over contact min.: 5 VAC/5 VDC/10 mA; delay <10 ms
Transistor output (Presets 1 + 2)	PNP output 12–30 VDC, max. 50 mA for DC supply 12–24 VDC, max. 30 mA for AC supply 24 VDC, max. 50 mA for AC supply with switch-mode power supply
Application output	PNP output 12–30 VDC, max. 20 mA for DC supply 12–24 VDC, max. 20 mA for AC supply 24 VDC, max. 20 mA for AC supply with switch-mode power supply
AC transformer only	Combined current load of outputs (sensor 12-24 VDC, Out1, Out2, app. output) must not exceed 65 mA.

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COUNTER

Counter mode Input A,B	Unidirectional; adding or subtracting; directional input; Differential operation, add/sub; totalizing add/add; phase discriminator single, double or quadruple evaluation
Control input	Reset, gate
Preselect modes	Absolute or trailing, range signal/ limit values (signal 1 <P1, signal 2 >P 2)
Application input/output	Output: prescaler out, preset 0 out, direction out Input: additional counter input add/sub, reset, set, gate, keylock, hold, teach in

BATCH COUNTER

Mode	Batch counter with preset or 2nd totalizer with preset

SHIFT COUNTER

Counter mode of operation	Differential counting add/sub, totalizing add/add

TACHOMETER

Measuring principle	Period (cycle) measurement (1/tau)
Time base	1/min or 1/s
Min. frequency	1 Hz or 0.1 Hz
Limit values	2 alarms with programmable startup suppression + 1 additional upper limit value on the application output
Tachometer mode of operation	Unidirectional add/sub; directional input Differential add/sub; totalizing add/add; Phase discriminator single, double or quadruple evaluation A/B or (A–B)/A%
Application input/output	Output: Preselect 0 out, direction out Input: Additional counter input add/sub, keylock, hold, teach in
Accuracy of the tachometer function	Time base: ± 30 ppm Measuring principle: cycle duration measurement Measuring time: min. 0.5s/max. 1s or 10s Measuring resolution: 0.4µs (<30 ppm) Display resolution: 4 decimal places, 1 digit = 100 ppm
Overall tolerance	= displayed resolution + tolerance of timebase = 130 ppm

TIMER

Measuring principle	Pulse-width or cycle duration measurement Start input A + Stop input B; Start/Stop key
Time base	Programmable in sec, min, h or hh.mm.ss
Resolution	1; 0.1; 0.01; 0.001; 0.0001
Function	Single-pulse or cumulative measurement
Application input/output	Output: preset 0 out, Input: additional run, stop, reset, set, keylock, hold, teach in

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Multifunctional counter   tico 772/773/774

|	
Accuracy of the timer	Time base: ± 30 ppm Start/Stop-point in time: 16 µs/16 ms (not damped/damped) Resolution: 100 µs = 100 ppm
Overall tolerance	= Displayed resolution + tolerance of timebase = 130 ppm

ENVIRONMENTAL REGULATIONS, SAFETY PROVISIONS

Safety provisions	EN 61 010-1/IEC 61010-1
Protection class	II; EN 61010-1/IEC 61010-1
Pollution degree	V 2, EN 50178
EMC interference compatibility	EN 61326-1 industrial environment**
EMC emissions	EN 61326-1 Class B**
Ambient temperature	0°-50°C EN 60 068-2-1/2
Storage temperature	-20° to +65°C EN 60 068-2-1/2
Climate	40°C/93% rel. humidy class 4K4H, EN 60 068-2-78 25-50°C/93% rel. humidity cyclical, EN 60 068-2-38
Ingress protection	IP 65 front; EN 60529 IP 20 terminals
Vibration resistance	10 m/s² (10 to 150 Hz); IEC 60 068-2-6
Shock resistance	100 m/s² (18 ms); IEC 60 068-2-27
Resistance to chemicals	Front film to DIN 42 115-2
Approvals	UL
RoHS	Compliant

PHYSICAL DATA

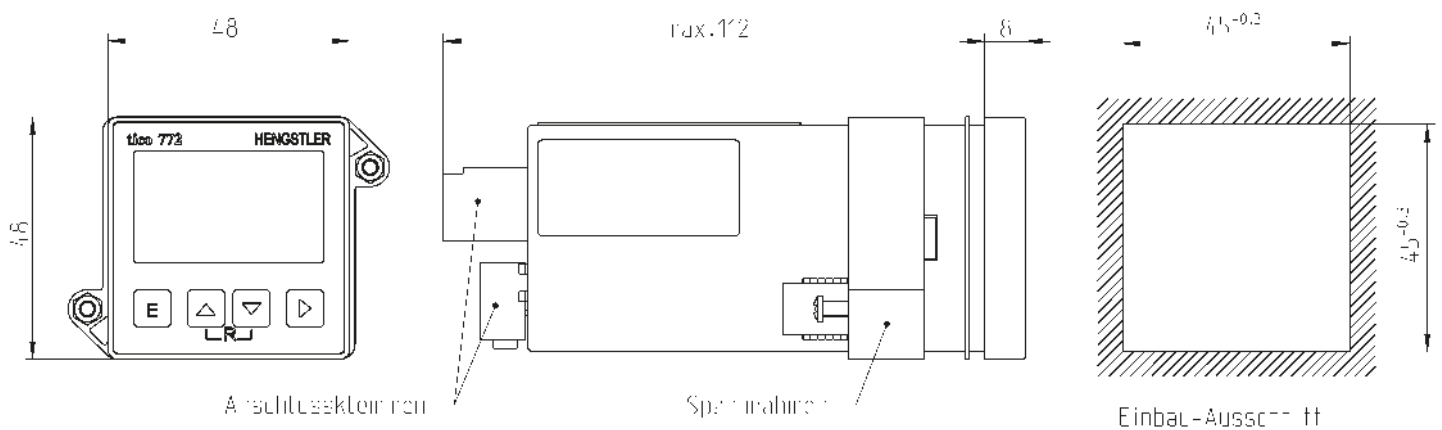|	
Installation	Front-panel installation with tenter (frame) Front panel thickness max. 11 mm
Dimensions	In accordance with DIN 43700, 48 mm x 48 mm x 118 mm, installation depth 110 mm
Front-panel cutout	45 mm x 45 mm + 0.3 mm
Weight	Approx. 200 g

** For cable lengths >30 m, connection to DC supply and input level TTL,
  additional protective circuits will be necessary.

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COUNTING FREQUENCY AS A FUNCTION OF SIGNAL VOLTAGE
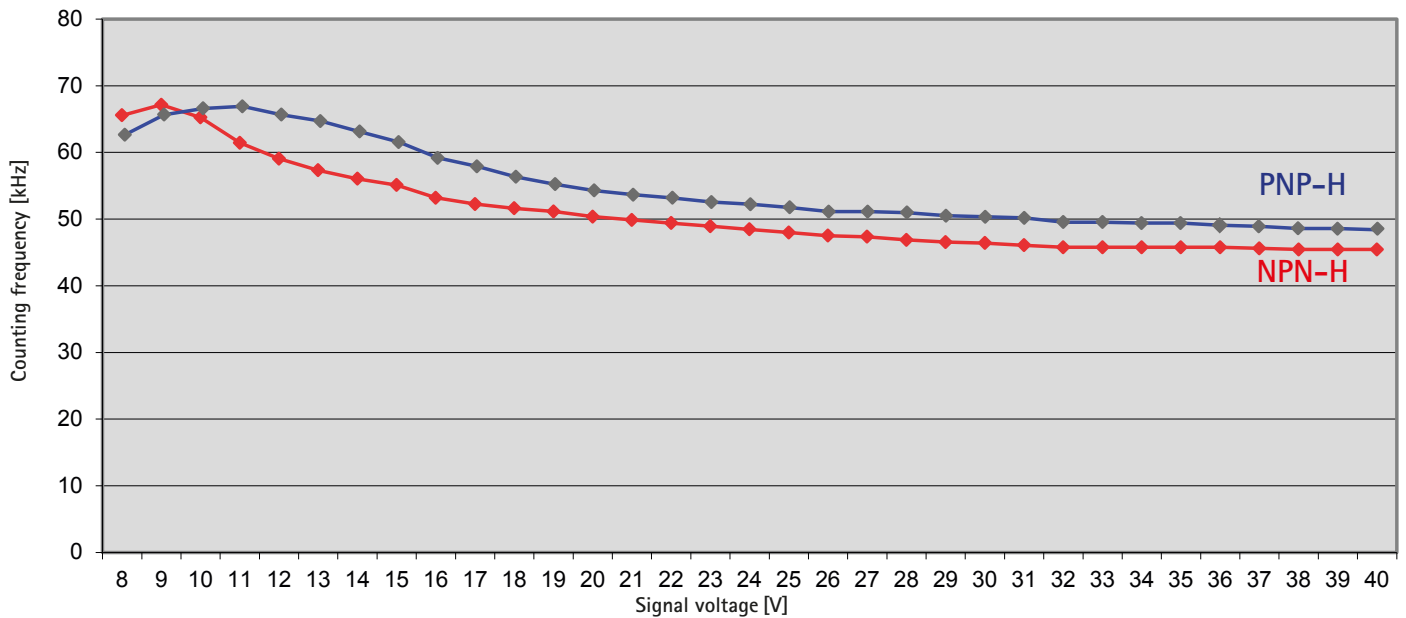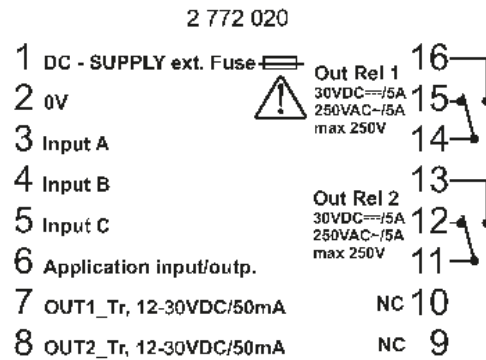

The counting frequencies were determined using a signal generator with an output resistance of 50 ohms.
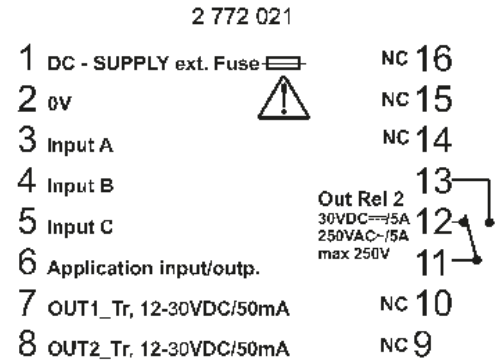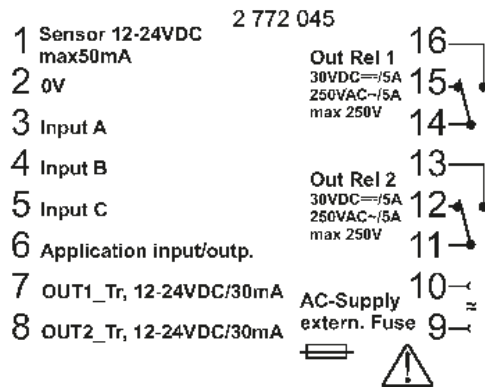
DIMENSIONED DRAWINGS
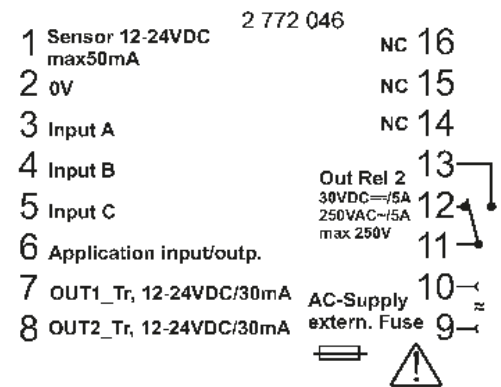
CONNECTION OPTIONS

2 772 020

Pin		Pin	
1	DC - SUPPLY ext. Fuse	16	Out Rel 1
2	0V	15	30VDC==/5A 250VAC~/5A max 250V
3	Input A	14	
4	Input B	13	Out Rel 2
5	Input C	12	30VDC==/5A 250VAC~/5A max 250V
6	Application input/outp.	11	
7	OUT1_Tr, 12-30VDC/50mA	NC 10	
8	OUT2_Tr, 12-30VDC/50mA	NC 9	

VDC 2 relays/2 transistors

2 772 021

Pin		Pin	
1	DC - SUPPLY ext. Fuse	NC 16	
2	0V	NC 15	
3	Input A	NC 14	
4	Input B	13	Out Rel 2
5	Input C	12	30VDC==/5A 250VAC~/5A max 250V
6	Application input/outp.	11	
7	OUT1_Tr, 12-30VDC/50mA	NC 10	
8	OUT2_Tr, 12-30VDC/50mA	NC 9	

VDC 1 relay/2 transistors

2 772 045

Pin		Pin	
1	Sensor 12-24VDC max50mA	16	Out Rel 1
2	0V	15	30VDC==/5A 250VAC~/5A max 250V
3	Input A	14	
4	Input B	13	Out Rel 2
5	Input C	12	30VDC==/5A 250VAC~/5A max 250V
6	Application input/outp.	11	
7	OUT1_Tr, 12-24VDC/30mA	10	AC-Supply extern. Fuse
8	OUT2_Tr, 12-24VDC/30mA	9	

VAC Transformer 2 relays/2 transistors

2 772 046

Pin		Pin	
1	Sensor 12-24VDC max50mA	NC 16	
2	0V	NC 15	
3	Input A	NC 14	
4	Input B	13	Out Rel 2
5	Input C	12	30VDC==/5A 250VAC~/5A max 250V
6	Application input/outp.	11	
7	OUT1_Tr, 12-24VDC/30mA	10	AC-Supply extern. Fuse
8	OUT2_Tr, 12-24VDC/30mA	9	

VAC Transformer 1 relay/2 transistors

2 772 022

Pin		Pin	
1	Sensor 24VDC max115mA	16	Out Rel 1
2	0V	15	30VDC==/5A 250VAC~/5A max 250V
3	Input A	14	
4	Input B	13	Out Rel 2
5	Input C	12	30VDC==/5A 250VAC~/5A max 250V
6	Application input/output	11	
7	OUT1_Tr, 24VDC/50mA	10	AC-Supply 100-240V extern. Fuse
8	OUT2_Tr, 24VDC/50mA	9	
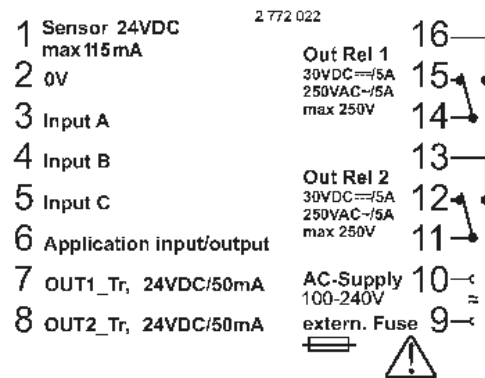
VAC Switch-mode power supply
2 relays/2 transistors

2 772 023

Pin		Pin	
1	Sensor 24VDC max115mA	NC 16	
2	0V	NC 15	
3	Input A	NC 14	
4	Input B	13	Out Rel 2
5	Input C	12	30VDC==/5A 250VAC~/5A max 250V
6	Application input/outp.	11	
7	OUT1_Tr, 24VDC/50mA	10	AC-Supply 100-240V extern. Fuse
8	OUT2_Tr, 24VDC/50mA	9	
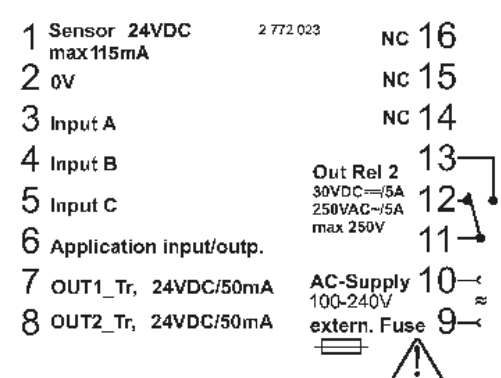
VAC Switch-mode power supply
1 relay/2 transistors

USB - Ports
Sicht auf die Gerätebuchse
View of the Plug

USB-Stick   USB-Cable

1 2 3 x 4

1 = VBUS (4.75-5.25 volts)
2 = Data-
3 = Data+
4 = GND

2 772 060

USB interface on Tico 773

Serial RS232 Port
Sicht auf die Gerätebuchse
View of the Plug

RXD   TXD   GND

Baudrate: 38,4 kBd,   Bits: 8
Parity: even,   Stopbits: 1

2 772 061
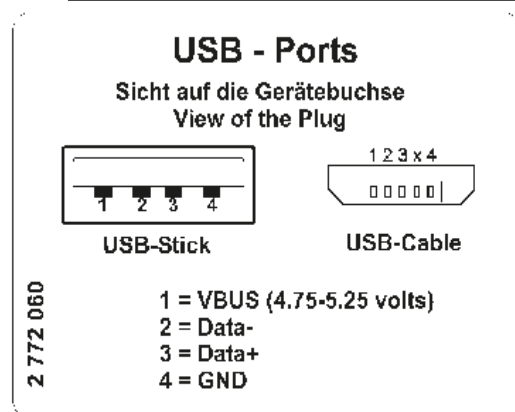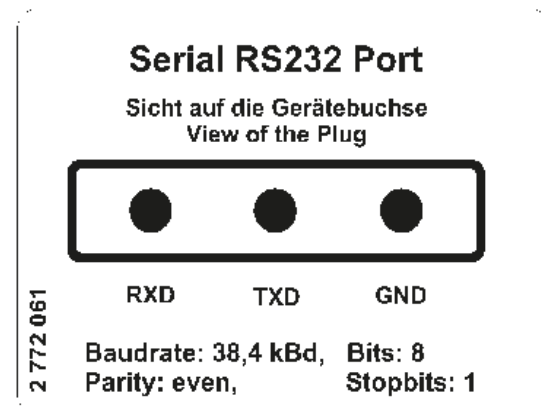
RS232 interface on Tico 774

ORDER INFORMATION

Display	Relays	12–30 VDC	24 VAC	115 VAC	230 VAC	100-240 VAC
Tico 772						
LCD reflective	1	0 772 101	0 772 111	0 772 121	0 772 131	0 772 141
LCD reflective	2	0 772 102	0 772 112	0 772 122	0 772 132	0 772 142
Transmissive negative	1	0 772 301	-	-	-	0 772 341
Transmissive negative	2	0 772 302	-	-	-	0 772 342
Transmissive red	1	0 772 401	-	-	-	0 772 441
Transmissive red	2	0 772 402	-	-	-	0 772 442
Transmissive green	1	0 772 501	-	-	-	0 772 541
Transmissive green	2	0 772 502	-	-	-	0 772 542
Tico 773 with USB port						
LCD reflective	1	0 773 101	-	-	-	0 773 141
LCD reflective	2	0 773 102	-	-	-	0 773 142
Transmissive negative	1	0 773 301	-	-	-	0 773 341
Transmissive negative	2	0 773 302	-	-	-	0 773 342
Transmissive red	1	0 773 401	-	-	-	0 773 441
Transmissive red	2	0 773 402	-	-	-	0 773 442
Transmissive green	1	0 773 501	-	-	-	0 773 541
Transmissive green	2	0 773 502	-	-	-	0 773 542
Tico 774 with RS232 port						
LCD reflective	1	0 774 101	-	-	-	0 774 141
LCD reflective	2	0 774 102	-	-	-	0 774 142
Transmissive negative	1	0 774 301	-	-	-	0 774 341
Transmissive negative	2	0 774 302	-	-	-	0 774 342
Transmissive red	1	0 774 401	-	-	-	0 774 441
Transmissive red	2	0 774 402	-	-	-	0 774 442
Transmissive green	1	0 774 501	-	-	-	0 774 541
Transmissive green	2	0 774 502	-	-	-	0 774 542

Transmissive negative: white figures on a dark background
Transmissive red: red figures on a dark background
Transmissive green: green figures on a dark background