Indicators

Hengstler displays are designed to handle practically all analogue measuring tasks extremely well, with output and alarm functions for task monitoring. Data of all types can be pre-processed using the linear output or the RS 485 interface.

Using the PLC display, you can get visible access to your data at a low price.

Typical applications:

- Temperature display and monitoring
- Voltage and current monitoring
- Weight, force and tension display or monitoring
- Recording of current and elapsed flow throughput
- Measuring techniques
- Testing techniques
- Control rooms
- Service display
- PLC system error detection
- PLC display

PLC and Process Indicators
With limit values




Type	tico 731 PLC Indicator	tico 735 DC Process Indicator	tico 735 Temperature Indicator	tico 735 volt/amp Indicator
Features	■ Integrated miniature PLC indicator ■ 8-digit LCD display or 6-digit LED display ■ Clock and data signal control (bit-serial) ■ Graphics or BCD mode ■ Simple protocol ■ Key evaluation	■ Large dual-colour, 5-digit LED display ; digit height 18.5 mm ■ Programmable colour change for alarm indication ■ 2 alarms ■ Upgradable options: RS 485, linear output, digital input ■ Non-linear display scaling up to 10 points ■ Tare/offset function ■ Alarm duration indication ■ Totalizing of process values by integration	■ Large dual-colour, 5-digit LED display, digit height 18.5 mm ■ Programmable colour change for alarm indication ■ 2 alarms ■ Upgradable options: RS 485, linear output, digital input ■ Free scaling ■ Input range can be trimmed ■ Alarm length indication ■ Sensor break detection after two seconds	■ Large dual-colour, 5-digit LED display, digit height 18.5 mm ■ Programmable colour change for alarm indication ■ 2 alarms ■ Upgradable options: RS 485, linear output, digital input ■ Free scaling ■ Input range can be trimmed ■ Alarm length indication ■ Up to 600 V
Technical Data Dimensions (mm) (Width x Height x Depth)	48 x 24 x 60	96 x 48 x 100	96 x 48 x 100	96 x 48 x 100
Front panel cutout (mm)	45 x 22.5	92 x 45	92 x 45	92 x 45
Display	LCD 8-digit, 7 mm LED 6-digit, 7.6 mm	LED 5-digit, 18.5 mm Dual-colour	LED 5-digit, 18.5 mm Dual-colour	LED 5-digit, 18.5 mm Dual-colour
Protection	IP 65	IP 66	IP 66	IP 54
Supply voltage	12-24 VDC	22-55 VDC / 20-50 VAC or 90-264 VAC	22-55 VDC / 20-50 VAC or 90-264 VAC	12-24 VDC; 24 VAC or 100-240 VAC
Temperature range	- 10-50 °C	0-55 °C	0-55 °C	0-50 °C
Inputs Measuring range	PNP/NPN - adjustable	0/4 -20 mA; 10-50 mA 0/2-10 V; 0/1-5 V; ± 100 mV; ± 10 V	J,T,K,N,B,R,S, PT 100	100 mV...600 V 1 mA...1A
Scanning	max. 1200 baud	100 ms	250 ms	250 ms
Accuracy		0.01 %	0.1 %	0.1 %
Control inputs	Clock and data signals bit-serial	Programming lock or Tare function	Programming lock	Programming lock
Outputs Alarms	PNP max. 10 mA, as long as the key is pressed	2 transistor outputs 1 relay (changeover) Optional: 2nd relay	2 transistor outputs 1 relay (changeover contact) Optional: 2nd relay	2 transistor outputs 1 relay (changeover contact) Optional: 2nd relay
Auxiliary voltage		24 VDC; max. 30 mA		24 VDC; max. 30 mA
Page	146	150	150	150

Process Indicators with Limit Values

Type	tico 735 AC volt/amp. indicator	tico 735 measuring bridge		
Features	■ Large dual-colour, 5-digit LED display, digit height 18.5 mm ■ Programmable colour change for alarm indication ■ 2 alarms ■ Upgradable options: RS 485, linear output, digital input ■ Free scaling ■ Alarm length indication	■ Large dual-colour, 5-digit LED display, digit height 18.5 mm ■ Programmable colour change for alarm indication ■ 2 alarms ■ Upgradable options: RS 485, linear output, digital input ■ Non-linear display scaling up to 10 pt. ■ Alarm length indication ■ tara and/or offset ■ total qty. by integration		
Technical Data Dimensions (mm) (Width x Height x Depth)	96 x 48 x 100	96 x 48 x 100		
Front panel cutout (mm)	92 x 45	92 x 45		
Display	LED 5-digit, 18.5 mm Dual-colour	LED 5-digit, 18.5 mm Dual-colour		
Protection	IP 66	IP 66		
Supply voltage	22-25 VDC; 20-50 VAC, or 90-264 VAC	22-25 VDC; 20-50 VAC, or 90-264 VAC		
Temperature range	0-55 °C	0-55 °C		
Inputs Measuring range	1 V ... 600 V 1 mA...1 A	0–100 mV ± 100 mV		
Scanning frequency	250 ms	100 ms		
Accuracy	0.1 %	0.03 %		
Control inputs	Program lockout	Program lockout or tara		
Outputs Alarms	2 transistor outputs 1 relay (changeover contact) Optional: 2nd relay	2 transistor outputs 1 relay (changeover contact) Optional: 2nd relay		
Auxiliary voltage	24 VDC, max. 30 mA	Measuring bridge supply 5 V or 10 V, 60 mA		
Page	150	150		

tico 731

Flexible Counter Series
in DIN size 24 x 48 mm

- high contrast 8-digit LCD display or brilliant 6-digit LED display
- 2 different supply voltages available:
  – independent of mains supply with lithium battery or
  – maintenance-free and
  environmentally friendly with 12-24 V DC supply
- also high-voltage input 12-250 V AC/V DC
- up to 8 different functions for each standard model:
  01 pulse counter
  02 tachometer (1/min)
  03 time counter (hhhh:mm:ss)
  04 time counter (hhhhhh,hh)
  05 numerical display for the PLC (serial)
  06 bidirectional position indicator
  07 counter with differential mode
  08 maintenance counter (on request)

OVERVIEW

Standard Models	Type 2	Type 4	Type 5
Hardware			
Display	8-digit LCD	8-digit LCD	6-digit LED
Supply voltage	12 – 24 VDC	12 – 24 VDC	12 – 24 VDC
Nominal data retention	NV-FRAM > 10 years	NV-FRAM > 10 years	NV-FRAM > 10 years
Active edge negative or positive edge programmable	Clock PNP DATA NPN	x	x
Amplitude thresholds	< 0.7 and > 5 V, max. 30 V DC	< 0.7 and > 5 V, max. 30 V DC	< 0.7 and > 5 V, max. 30 V DC
Transmission rate	100 Hz	1 kHz	1 kHz
Inputs	Clock + Data	Clock + Data	Clock + Data
Mounting depth	32 mm	60 mm	60 mm
Software			
Impulse counter	x	x	x
Tachometer 1/min	x	x	x
Time counter h : 1/100 h	x	x	x
Time counter h : min : s	x	x	x
Numerical display for PLC	x	x	x
Position indicator bi directional		x	x
Counter with differential mode			x
Maintenance counter			

Technical data tico 731

TYPE 2

- LCD display
- DC supply voltage 12 – 24 V DC
- CLOCK-input for voltage signal (positive 100 Hz)
- RESET: DATA-input NPN (negative)
- Short case

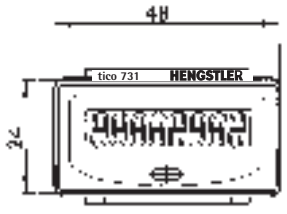
TECHNICAL DATA

Operating temperature	-10 ... 50 °C
Strorage temperature	-20 ... +60 °C
Electrical connection	screw terminals
Mounting	with clamping frame
Front panel cutout	45 + 0.6 x 22 + 0.3 mm
Protective system (IEC 144)	front side IP 65, terminals IP 20
Dynamic strength	10 m/s² (10 ... 150 Hz) according to IEC 68-T2-6
Shock stability	100 m/s² (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

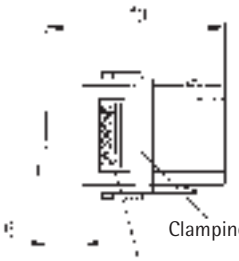
Inputs:	
Amplitude thresholds	(CLOCK- and DATA-input) < 0.7 V and > 5 V, max. 30 V DC
Active edge/ Counting frequency	CLOCK-input, PNP (100 Hz) active edge positive DATA-input, NPN (100 Hz) active edge negative

Button	no function
Counting frequency	transmission rate for numerical display: 100 Hz

DIMENSIONS CONNECTION DIAGRAM



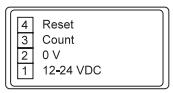
Dimensions in mm



Clamping frame

Connecting terminal

Terminal assignment:



ORDER NUMBER

Model tico 731

0 731	2	0	5	* S

*Option: with plug-in screw terminals

Software function
01 impulse counter
02 tachometer (1/min)
03 time counter (hhhh:mm:ss)
04 time counter (hhhhhh.hh)
05 numerical display for PLC

tico 731

Technical data

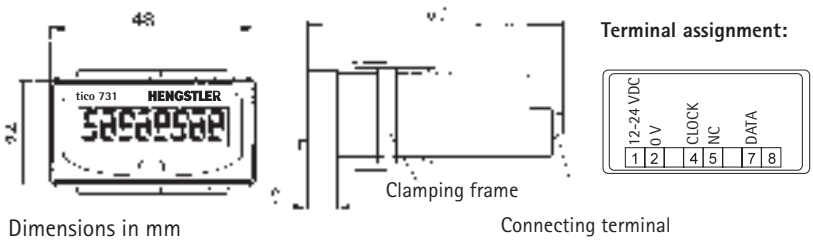
TYPE 4

- LCD display
- 12-24 V DC supply voltage
- CLOCK- and DATA: programmable for voltage signal (PNP positive or NPN negative, max. 1200 Baud)
- Long case

TECHNICAL DATA

Operating temperature	-10 ... 50 °C
Strorage temperature	-20 ... +60 °C
Electrical connection	screw terminals
Mounting	with clamping frame
Front panel cutout	45 + 0.6 x 22 + 0.3 mm
Protective system (IEC 144)	front side IP 65, terminals IP 20
Dynamic strength	10 m/s² (10 ... 150 Hz) according to IEC 68-T2-6
Shock stability	100 m/s² (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
CLOCK and DATA input:	
amplitude thresholds	voltage input to 1200 Baud < 0.7 V and > 5 V, max. 30 V DC
Active edge/ Counting frequency	programmed as voltage input: active edge positive, programmed as NPN-input: active edge negative; 1200 Baud
Button	activate output
Voltage/switching current	voltage supply minus 2 V; max. 10 mA
Counting frequency	transmission rate for numerical display: 1 kHz

DIMENSION
CONNECTION DIAGRAM



ORDER NUMBER

0 731 | 4 | **0** | **5**

Model tico 731

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

Technical data tico 731

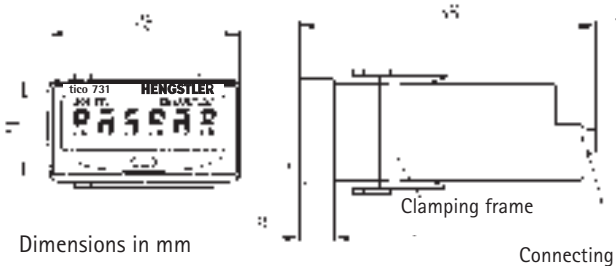
TYPE 5

- LED display
- 12-24 V DC supply voltage
- CLOCK- and DATA: programmable for voltage signal (PNP positive or NPN negative, max. 1200 Baud)
- Long case

TECHNICAL DATA

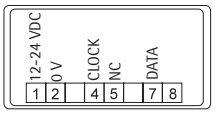
Operating temperature	-10 ... 50 °C
Strorage temperature	-20 ... +60 °C
Electrical connection	screw terminals
Mounting	with clamping frame
Front panel cutout	45 + 0.6 x 22 + 0.3 mm
Protective system (IEC 144)	front side IP 65, terminals IP 20
Dynamic strength	10 m/s² (10 ... 150 Hz) according to IEC 68-T2-6
Shock stability	100 m/s² (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
CLOCK and DATA input:	
Amplitude thresholds	voltage input up to 7.5 k 1200 Baud: < 0.7 V and > 5 V, max. 30 V DC
Active edge/ Counting frequency	programmed as voltage input: active edge positive, programmed as NPN-input: active edge negative; 1200 Baud
Button	activate output
Voltage/switching current	supply minus 2 V; max. 10 mA
Counting frequency	transmission rate for numerical display: 1 kHz

DIMENSION CONNECTION DIAGRAM



Dimensions in mm

Terminal assignment:



Connecting terminal

ORDER NUMBER

0 731	5	0	5

Model tico 731

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

tico 735

Process Indicator with Dual-Colour Display in DIN size 48 x 96 mm

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 programs your own choice of display colour to indicate normal or alarm conditions.

FEATURES

- 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
- High measurement rate
- Analogue versions can be user-calibrated according to BS 4937, IEC 584 R ISO 9001
- Option: Linear output 0/4-20 mA, 0/1-5 V, 0/2-10 V, 10 bit resolution
- Option: RS 485 ASCII protocol serial interface for all versions. "Remote Display" version receives process values over RS 485
- Option: Control input for Tara function or program disable

Version Overview tico 735

Process Indicators

Five digit display – Flexible Configuration – High Accuracy

Practically all analogue measurement tasks, particularly reliable process monitoring, can be solved with just 5 basic versions. Alarm and output functions can be programmed to meet your requirements, enabling band alarm or limit values, with or without storage feature.

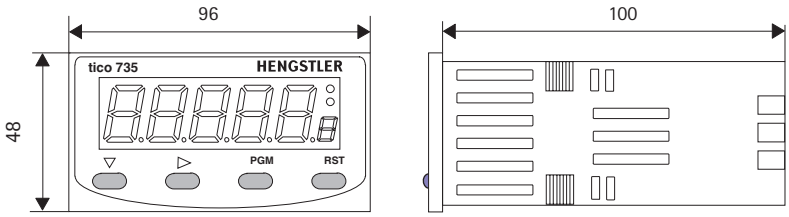
With the optional linear output, you can integrate the tico 735 into process visualisation or control systems as it can then function as a transmitter.

	Evaluation, Features	Value Ranges
DC PROZESS	High Accuracy	0.01 %
	Input Ranges programmable	0/4-20 mA, 10-50 mA, 0/2-10 V, 0/1-5 V, ±100 mV, ±1 V, ±10 V
	Non-Linear Scaling up to 10 points	-19999...99999
	Process Offset Value	-19999...99999
	Elapsed time of Alarm1 (Seconds)	0...99999
	Totalising of Process Values by interval	seconds, minutes, hours
	Option: Tare function -> Process Offset	-19999...99999
TEMPERATURE	High Accuracy	0.1 %
	Input Ranges programmable	J, T, K, N, B, R, S, PT100
	Sensor break detection	2 seconds max
	Input Range can be trimmed	Range min to Range max
	Elapsed time of Alarm 1 (Seconds)	0...99999
DC VOLT/AMPS	High Accuracy	0.1%
	DC Volt range	100 mV...600 V
	DC Amps range	1 mA ...1 A, 2 A with shunt
	Process Offset	-19999...99999
	Elapsed time of Alarm1 (Seconds)	0...99999
AC VOLT/AMS (RMS)	AC Volt range	1 V...600 V
	AC Amps range	1 mA ...1 A
	Process Offset	-19999...99999
	Elapsed time of Alarm1 (Seconds)	0...99999
REMOTE DISPLAY	Process value via serial interface	via RS 485 (ASCII)
	Alarm 1 and 2 monitored autonomously	-19999...99999
	Min/Max stored automatically	-19999...99999

tico 735

Technical data

DIMENSIONS



Dimensions in mm

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 LEDs 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	$45^{+0.3}$ mm x $92^{+0.3}$ 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

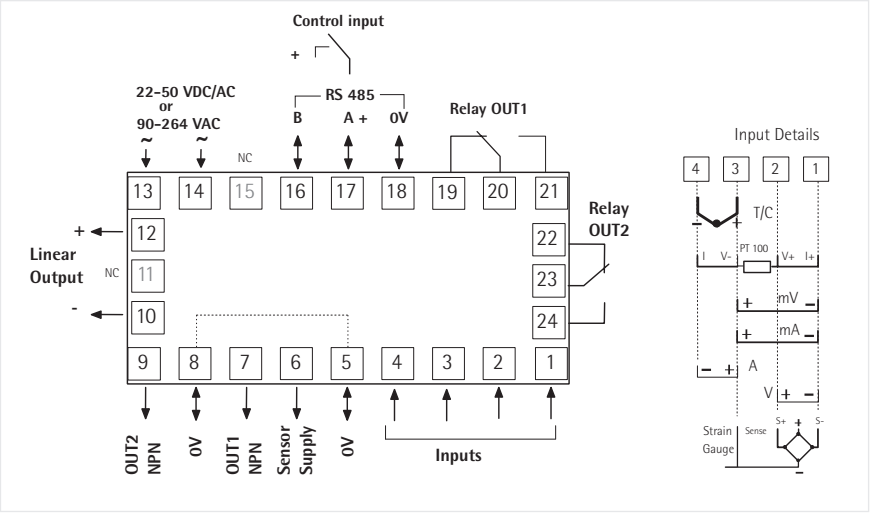
OPTION RS 485

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

OPTION LINEAR OUTPUT

Insulation	optically isolated, 250 V AC or 400 V DC from all inputs and outputs
Output Ranges	0-20 mA, 4-20 mA, 0-10 V, 2-10 V, 0-5 V, 1-5 V
Accuracy	± 0.25 % (mA on 250 Ohms, V at 2 kOhm); Deviation ± 0.5 %
Resolution	8 bits after 250 ms (10 bits after 1000 ms typically)
Updates	approx. 4 per second
Load	mA: max 500 Ohm, V: min. 500 Ohm

TERMINALS



SIGNAL INPUTS

General	Common mode rejection > 120 dB at 50/60 Hz; Line voltage rejection > 140 dB Series mode rejection up to 500 % of span Temperature coefficient: ± 25 ppm / °C
Calibration	according to BS 4937, NBS 125 and IEC 584 (all units are factory calibrated)

OUTPUTS

OUT1 NPN OUT2 NPN	Open Collector; max 30 V DC; max 100 mA response time < 75 µs
Relay 1, Relays 2 (opt.)	Changeover (Form C); 240 V AC / 3A or 110 V AC / 5 A; pull-in time 8 ms
Auxiliary Power	24 V DC, 30 mA max for strain gauge: 5 V DC or 10 V DC, 60 mA max

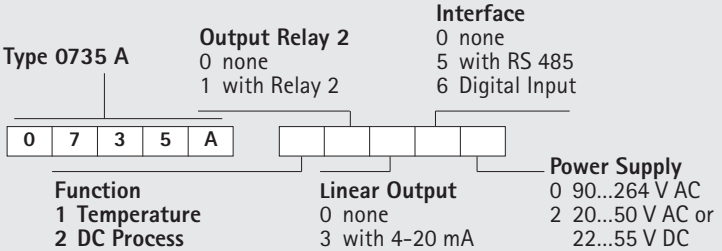
OPTION CONTROL INPUT (not with Option RS 485)

NPN	High ≥ 3.0 V or open, Low < 2.0 V; 4.7 kOhm to V+ reponse time 25 ms

SPECIAL FEATURES

- Programmable display colour for normal and alarm operation
- Alarm programmable as high or low; can be deactivated or blocked
- Output signals programmable; can be inverted and/or stored
- Process offset
- Display filter programmable up to 100 sec.
- Tare function and non-linear scaling with 0735 A2 and 0735 A6
- Optional Linear Output
- Optional Tara function or program disable

ORDERUNG DATA



Option module	Ordering code
Relay 2	1 901 001
Linear output	1 901 003
RS 485 interface	1 901 004
Digital input	1 901 005

Notes