



- ★ **III** certified, 10000, U2375 4000, U2379 6000 intervals,  $\geq 0.6\mu V$ ,  $p_i = 0.4$ , including multi range, RS232/485, synchronous outputs and other I/O interfaces, counting mode, set points. Certificates: No. 0402-MV/m016, rev. 1. TAC: FI 98.1.02 rev. 1.
- ★ U2375 has adjustable tilt compensation up to  $\pm 16\%$ .
- ★ U2379 **Ex** EEx ib IIC T4 for hazardous areas.
- ★ Protected window for descriptive markings.
- ★ Very flexible software calibration.
- ★ Stable weight from noisy and oscillating signals.

These are low price, high performance weight indicators. They have a small but sturdy. The low level circuits are electrically and thermally well shielded, and the temperature and long time stability are excellent.

The indicator excites a bridge transducer (load cell). The signal is amplified in a low noise, stable amplifier. An adjustable low pass filter, with optimized response time, effectively suppresses signal oscillations and transients. The ratio between the signal and sense voltage is measured in a high resolution AD converter of continuously integrating type. The influence of noise is reduced to an incredible low level and the AD-value may be presented with up to seven digits.

The standard hard- and software meet a great number of applications e.g., the parameters for zero setting, instability (motion) and mean value are easy to change. The measurement time may vary between 60ms and 80 seconds. Multi range up to six times may be chosen for fast scales with few increments. The calibration is performed from the keyboard or via the RS232 input. It is done in 2 or 3 points with linearization. The third point may be extrapolated, e.g. when full scale weight is missing.

Difference/time (flow) may be measured. It may be controlled by an external signal.

Reversed calibration is possible for accurate tank level measurement with displacement body.

There are many output protocols for the RS232 or RS485 interface available. The weight may be sent with 10 times extended resolution. Custom-made protocols, with up to 60 characters, status outputs and functions, may also be entered. Many functions may be controlled from the input.

U137 has 14mm LED and U237 has 16mm LCD (two versions) with backlight. More displays, parallel BCD, 0-20mA, 2 set points and other options are easily added.

The counting scale is easy to handle and very small pieces may be counted due to high internal resolution.

The indicator may operate in max/min value mode, which is helpful when checking stability or deviations.

A preset tare may be entered.

Up to 14 indicators with individual address may be used simultaneously with the optional full duplex RS485.

U1370 is 115 or 230VAC powered.

U2371, U2373 11-26VDC, U2370, U2375 11-29VDC.

U2372 has a built in rechargeable 12V battery

U2379 is powered with 6.2V from a EEx ib rechargeable battery supply, U2386, a [EEx ib] 230V supply, U2387 or a EEx d [ib] 230V supply, U2394.

U2373 is a low price version with a combined zero and tare button. Net/gross switching may be performed.

U2375 may have a separate transducer, U9027, for tilt compensation in two directions up to  $\pm 16\%$  ( $\pm 9.2^\circ$ ).

U1379 is the separate main board with all inputs and outputs including RS232. It is fed with 11-26V DC.

### OPTIONS AND ACCESSORIES.

U23850 Resistors for analog filter change. 6pcs.

U23900 Isolated analog output board.

U17300 Set point board, 2 semiconductor relays.

U23840 Universal output board, 4 semiconductor relays.

U23830 25p D-sub RS232 interface cable for U237 ser.

U17310 RS232, synchronous outputs, tare & print.

U17311 RS232, synchronous outputs.

U23890 RS485 full duplex interface in U137 series.

U17340 RS485, synchronous outputs, tare & print.

U23810 16mm LCD display board. Back light.

U13780 14mm remote LED display board.

U23881 16mm LCD display. IP66. U23880 Exi.

U13660 102mm remote LED display.

U12920 102mm RS232 remote LED display.

U14300 Battery eliminator 220V AC/12V $\pm 5\%$  DC 0.4A.

U14324 Battery charger 220VAC/800mA. U2372.

U23860 EEx ib battery supply, 6.2V, 150mA. U2379.

U23870 [EEx ib] 230V supply, 6.2V, 150mA. U2379.

U23940 EEx d [ib] 230V supply, 6.2V, 150mA. U2379.

U90270 Tilt transducer,  $\pm 16\%$  ( $\pm 9.2^\circ$ ) for U2375.

U10900 Mounting handle.

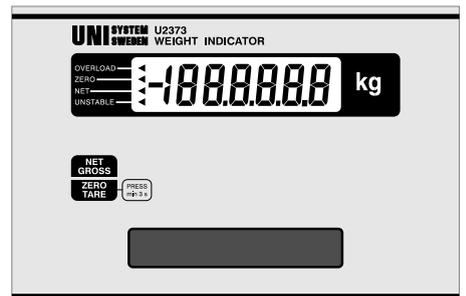
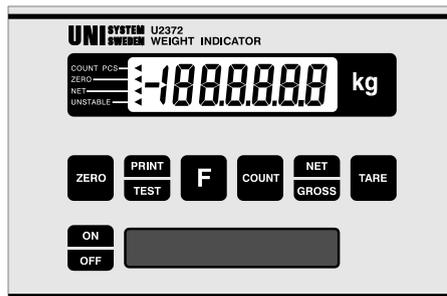
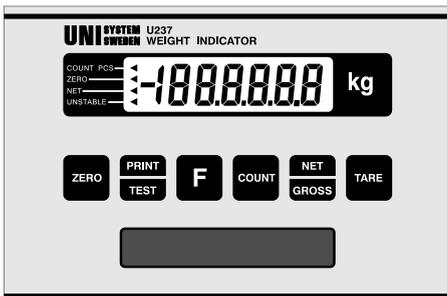
U13760 Assembly for panel mounting.

U13850 Large panel for U137 and U237 series.

U13770 Stainless IP67 box.

U23960 Calibration: 4,100.00 $\mu V/V \pm 0.01\%$ .

U14000 Accessories for verification.



**SPECIFICATION.**

**LOAD CELL EXCITATION VOLTAGE:** 10V, 200mA, U2379 5V, 60mA, without backlight 115mA. Max voltage drop for specified accuracy 10%. Short circuit protected.

**INPUT:** Sensitivity 0.63 to 2.67mV/V in 4 steps.

On request 3.42 or 4,27mV/V without positive offset.

Offset from -0.05 to 0.82mV/V in 10 steps.

Input current <1nA. Noise typical U237: 0.03µV, U137: 0.06µV at 1 second measuring time and full mean value.

**AD-CONVERTER:** 0.06 to 10 seconds integration time in 8 steps. 80 seconds with full mean value.

Max resolution 978,540 units/second.

Linearity better than 5ppm, typ. 2ppm. 1ppm = 10<sup>-6</sup>.

**STABILITY:** <2.5, typ. 1ppm/°C. Typ. 20ppm/year.

**LOW PASS FILTER:** 143ms or 1.1Hz. Response time to ±0.1%, 410ms and to ±0.01%, 820ms.

The filter may be changed from 13ms (12.5Hz) to 824ms (0.19Hz) by separate networks, U2385.

**POWER:** U2371/3: 11-26V DC, U2370/5 11-29V DC.

U1370: 200-260 or 100-130V AC.

U2372 has an internal 12V, 6.5Ah battery. Discharge protection circuits. On/off function or off timer.

U2379 has special 6.2V Exi zener barrier supplies.

At power on, the soft ware number and date are displayed.

Then the indicator is tested. The date is written yymmdd.

yy are the two last digits of the year, mm is the month and

dd the day. U1370 displays only the last y.

**DIMENSIONS:** 170x114x70, U2372 170x114x140mm.

Front panel 176x118x2mm.

Large front panel 204x166x2mm.

**RS232 INTERFACE:** 300, 1200, 2400, 9600 baud. U1370 9-p D-sub, male, DTE.

U2371/2/5 have the signals available on the power connector. Opt. U2383 or U1731, 25p D-sub, DTE.

Various continuous or printer protocols may be chosen.

The RS232 output of up to 15 indicators may be connected in series, and each has an address.

Weight output up to 6 digits and AD-value to 7 digits.

Own protocol up to 60 characters, functions and commands may be entered and stored.

**RS485 INTERFACE:** Opt. U2389 for U1370 or U1734. Full duplex. Up to 14 indicators may be addressed.

**SYNCHRONOUS OUTPUTS:** Opt. U1731.

Output 1 has signals for remote displays U1266, U1378 and BCD board U1278 or U2388.

Output 2 has 16 bits binary value for 20mA output board U2390, 2 setpoints for U1173 and signals for U2384.

**TEMPERATURE RANGE:** Operating -10 to +50°C. Storage -40 to +70°C.

**SELECTABLE FUNCTIONS:** Gravity compensation.

Interval (increment) 1, 2, 5, 10, 20 or 50 units.

Mean value, up to 8 measurements, calculated only, when the difference between the last measurement and the mean value is within the mean value band, which is selectable from 0.25 to 16 intervals or infinite.

Measurement (integration) time from 0.06 to 10s.

Stable weight, when 2 or 3 successive measurements are within a motion band, selectable from 0.25 to 16 intervals.

At unstable weight, the last digit may be blanked.

Leading zero blanking.

The printer output, tare and zero may be delayed until the weight is stable.

Zero tracking or automatic zero-setting speed may be chosen to 8, 16, 32 or 64 successive measurements within 1/2 interval in order to set to zero. Max. change may be set from 0.25 to 16 intervals.

Unload to zero range before new print.

Up to six ranges with equal intervals but the highest range, which may be set. Selectable range indication.

Multiple range according to OIML or automatic.

The rate of signal change (differentials or flow) may be measured with respect to time or an external pulse.

For measurement applications, calibration up to 999.999 units possible, e.g. load cell measurements at 100nV!

**KEYBOARD:** Touch keys with buzzer.

**ZERO** Sets the indicator to zero, when the signal is between -0.8% and +3.1% of full scale.

When pressed longer, the weight difference from calibration zero is displayed, in order to test the condition of the load cell.

Resets max or min value in peak value mode.

**PRINT** Print command. After this the display is switched on and off for test.

**TEST**

**F** For special functions.

**COUNT** Suggests 0, 1, 2, 5, 10, 20, 50 or 100 pieces, which are on the load receptor. When released at 0, previous stored unit weight is used.

Switches to max and min value in peak value mode and back to normal weight.

**NET** Switches the indicator between the tared and the total weight.

**GROSS**

**TARE** Is used to tare (autotare) the indicator. During unstable weight, the autotare is not performed alternatively after the weight is stable.

**ON** U2372 only. On/off function with off timer: 64, 256 or 1024 measuring cycles. Key push or weight

**OFF** change more than 8 times the motion band reset the timer.

**NET**

**GROSS**

**ZERO**

**TARE**

PRESS

min. 3 s

U2373 only. Short push switches between net and gross. When pushed longer than 3 seconds, the buzzer sounds again and in zero range the indicator is set to zero, else tared. When pushed longer in zero range, the weight difference from calibration is displayed.

**DISPLAY:** U137 series 5 digit 14mm LED display. U237 series 6 digits, 16.5mm LCD with backlight. Two versions.

**COUNT PCS** or **¢**: Displays number of pieces. Flashes for max and is on for min in peak value mode.

**ZERO:** Indicates that the load is within ±1/4 of an interval from zero. The NET indicator must be off. 00000 is indicated within ±1/2 interval.

**S** : Indicates that the displayed value is negative.

**NET:** Indicates that NET and GROSS values normally are different. No zero tracking. NET indication is switched off by pushing ZERO in the zero range.

**MOTION** or **Z**: Indicates unstable weight.

**CALIBRATION:** The calibration switch is located on the bottom panel. When it is put on, the indicator enters the software calibration mode and the internal AD-value is displayed. In the following calibration sequence, the functions and calibration may be changed from keyboard or via RS232. When the calibration switch is put off, the indicator enters weighing mode.