



Operating instructions

Series S302

Numeric large size displays
with programmable counter functions

1 Contact

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2 Legal note

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3 Safety precautions

Important information

Read these operating instructions before starting the unit. They provide you with important information on the use, safety and maintenance of the units. This helps you to protect yourself and prevent damage to the unit.



Information intended to help you to avoid death, bodily harm or considerable damage to property is highlighted by the warning triangle shown here; it is imperative that this information be properly heeded.

The operating instructions are intended for trained professional electricians familiar with the safety standards of electrical technology and industrial electronics.

Store these operating instructions in an appropriate place.

The manufacturer is not liable if the information in these operating instructions is not complied with.

Safety



Components inside the units are energized with electricity during operation. For this reason, mounting and maintenance work may only be performed by professionally-trained personnel while observing the corresponding safety regulations.

The repair and replacement of components and modules may only be carried out by the manufacturer for safety reasons and due to the required compliance with the documented unit properties.

The units do not have a power switch. They are operative as soon as the operating voltage is applied.

Intended use

The units are intended for use in industrial environments. They may only be operated within the limit values stipulated by the technical data.

When configuring, installing, maintaining and testing the units, the safety and accident-prevention regulations relevant to use in each individual case must be complied with.

Trouble-free, safe operation of the units requires proper transport, storage, installation, mounting and careful operation and maintenance of the units.

Mounting and installation

The attachment options for the units were conceived in such a way as to ensure safe, reliable mounting.



The user must ensure that the attachment hardware, the unit carrier and the anchoring at the unit carrier are sufficient to securely support the unit under the given surrounding conditions.

The units are to be mounted in such a way that they can be opened up while mounted. Sufficient space for the cables must be available in the unit near the cable entries.

Sufficient space is to be kept clear around the units to ensure air circulation and to prevent the build-up of heat resulting from use. The relevant information must be heeded in the case of units ventilated by other means.



When the housing fasteners are opened, the front frame of the housing hinges out upward or downward (depending on the unit version) automatically.

Grounding

All devices are equipped with a metal housing. They comply with safety class I and require a protective earth connection. The connecting cable for the operating voltage must contain a protective earth wire of a sufficient cross section (DIN VDE 0106 part 1, DIN VDE 0411 part 1).

EMC measures

The devices comply with the EU Directive 2004/108/EC (EMC Directive) and provide the required interference immunity. Observe the following when connecting the operating voltage and data cables:

Use shielded data cables.

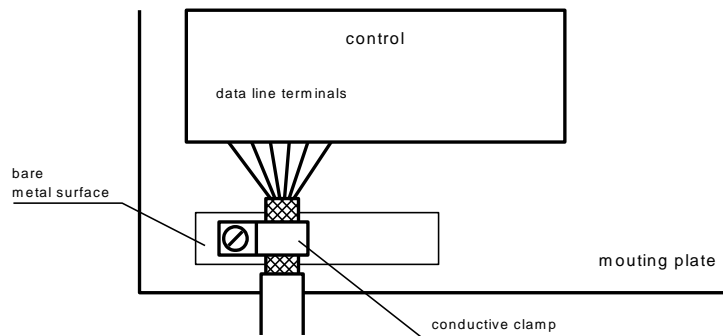
The data and operating voltage cables must be laid separately. They may not be laid together with heavy-current cables or other interference-producing cables.

The cable thickness must be properly assessed (DIN VDE 0100 Part 540).

The cable lengths inside the units are to be kept as short as possible to prevent interference. This applies especially to unshielded operating voltage cables. Shielded cables are also to be kept short due to any interference which might be emitted by the shielding.

Neither excessively long cables nor cable loops may be placed inside the units.

The connection of the cable shielding to the functional ground (PE) must be as short and low-impedance as possible. It should be made directly to the mounting plate over a large area with a conductive clip:



The cable shielding is to be connected at both cable ends. If equipotential bonding currents are expected due to the cable arrangement, electrical isolation is to be performed on one side. In this case, capacitive connection (approx. $0.1\mu\text{F}/600\text{ V AC}$) of the shielding on the isolated side must occur.

Disposal

Units or unit parts which are no longer needed are to be disposed of in accordance with the regulations in effect in your country.

4 Unit description

Model designation

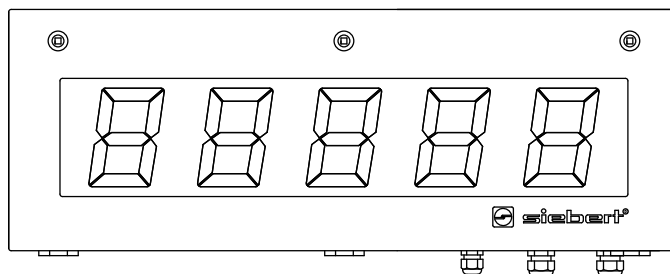
This manual applies to units with the following model designation (x = the 'x's in the model designation indicate the size and design of the units (see Chapter 6):

S302-xx/xx/xx-xxx/xx-Z0

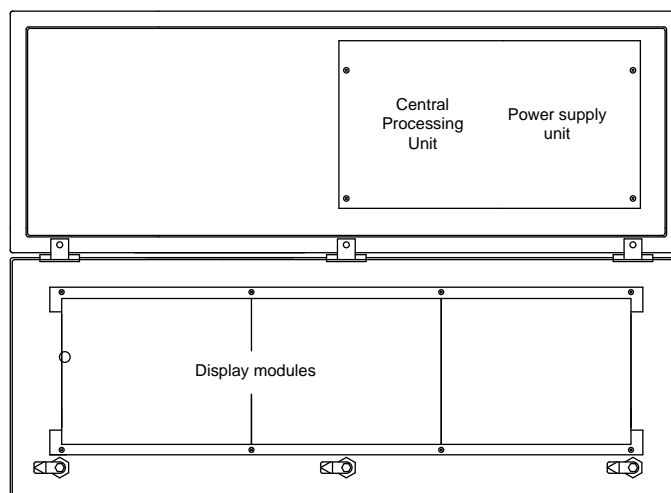
S302-xx/xx/xx-xxx/xx-Z1 (with interface extension for external coding switches, see Chapter 8).

Unit construction

The following figure shows model type S302-05/10/xx-xxx/xx-xx as example for the other model types. The front frame of the housing is locked with quick-action releases. When opening the unit the front frame hinges downward.

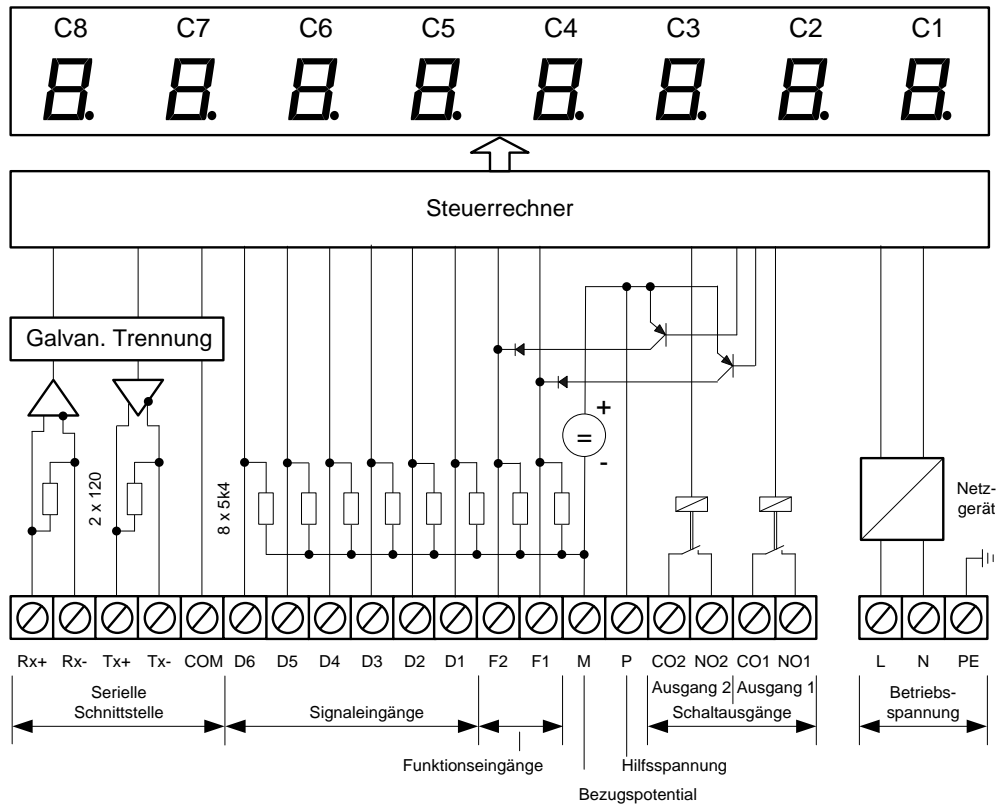


The following figure shows the unit when open.



Units with double-sided display show the same information on the front and on the rear side.

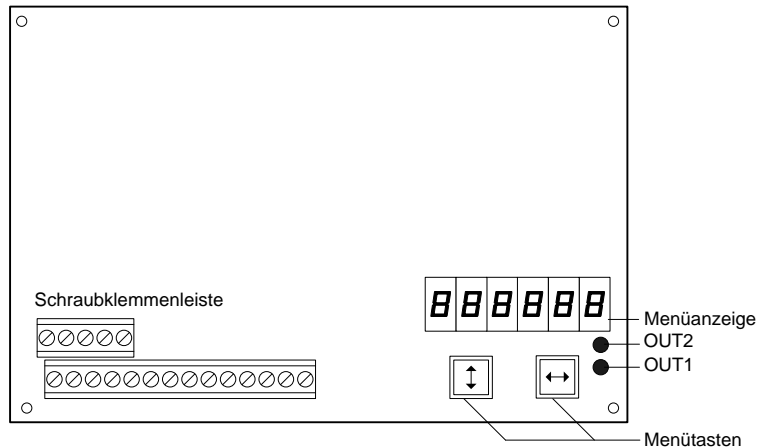
Principle circuit diagram



Steuerrechner	Central Processing Unit
Galvan. Trennung	Galvanic isolation
Serielle Schnittstelle	Serial interface
Signaleingänge	Signal inputs
Funktionseingänge	Function inputs
Bezugspotential	Reference potential
Hilfsspannung	Auxiliary voltage
Ausgang 2/Ausgang 1 Schaltausgänge	Output 2/Output 1 Switching outputs
Netzgerät	Power supply unit
Betriebsspannung	Power supply

Central Processing Unit

The following figure shows the Central Processing Unit, located in the lower part of the housing.



Schraubklemmenleiste	Screw-type terminal strip
Menüanzeige	Menu display
Menütasten	Menu buttons

Signal inputs

The signal inputs are located on the screw type terminal strip of the control computer. They are designed for the following signal voltages:

Signal voltage: L = -3.5...+5 V (open input = L)
 H = +18...30 V (active H), M = reference potential

Function inputs

The terminals F1 and F2 may be function inputs or electronic switching outputs (see Chapter 5).

The function inputs are designed for the following signal voltages:

Signal voltage: L = -3.5...+5 V (open input = L)
 H = +18...30 V (active H), M = reference potential

As electronic switching outputs they give the following signal:

H-signal = 24 V \pm 25 %, max. 5 mA
 M = reference potential

Auxiliary voltage

The units supply terminal P with an auxiliary voltage galvanically isolated from the operating voltage (24 V \pm 20%, max. 50 mA, M = reference potential). It can be used for supplying power to the current loop or as H signal for the function inputs.

Serial Interface

The units dispose of a galvanically isolated RS422 serial interface. They are located on the screw-type terminal strip and serve for reading out the display values and for entering the control commands.

Menu display

The parameterization of the units is carried out in a menu of the menu display (see Chapter 7). In normal mode, the menu display corresponds to the main display. The digits C8 and C7 are not shown in the menu table.

Menu buttons

The menu buttons are used to control the menu (see Chapter 7).

Switching output

The devices dispose of two switching outputs (relay) with potential-free make contact (output 1: CO1, NO1; output 2: CO2, NO2).

Status indicators

The status indicators (LEDs) of the control computer have the following meaning:

OUT1 Switching output 1 is active
OUT2 Switching output 2 is active

Overflow display

The display shows a ▯ (overflow) in case of a display overrange and a ▵ (underflow) in case of a display underrange.

Power supply

The screw-type terminals for the power supply are located on the power supply unit in the bottom section of the housing. They have the following designations:

Devices for a power supply 115 V AC or 230 V AC	L, N and PE
Devices for a power supply 24 V DC	+, – and PE

5 Control

The figures in [] indicate the lines in the following function table.

Counting functions

The signal inputs D2 and D1 are counting inputs.

If in menu item 1 setting $d \uparrow P$ is selected, the impulses arriving at input D1 will be counted. With L signal at input D2 impulses will be counted upward and downward with H signal [1].

If in menu item 1 setting $\downarrow \downarrow$ is selected, the impulses arriving at inputs D1 and D2 will be counted upwardly independently one from the other [2].

If in menu item 1 setting $d \downarrow$ is selected, the impulses arriving at input D1 will be counted upwardly and the impulses arriving at input D2 will be counted downwardly independently one from the other [3].

If in menu item 1 setting $d \downarrow d$ is selected, the impulses arriving at inputs D1 and D2 will be counted downwardly independently one from the other [4].

Impulse edge

Whether the counting inputs D2 and D1 analyze the rising or falling edge of the counting impulses can be set in menu item 2. With setting $r \uparrow SE$ the rising edge is analyzed and with setting $FALL$ the falling edge is analyzed.

The inputs D6 and D5 react to the rising edge of the signals. The inputs D4, D3, F2 and F1 are static.

Debouncing time

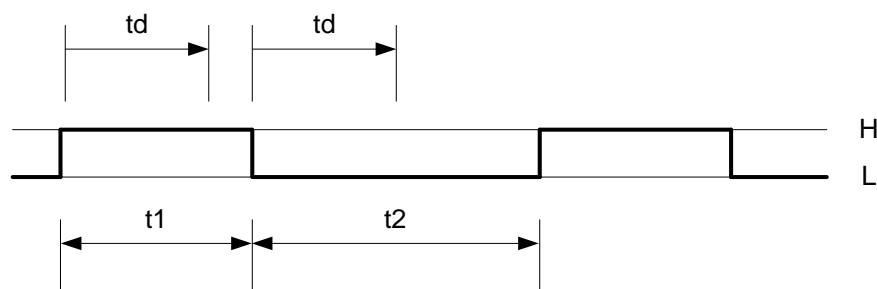
The signal inputs D6...D3 and the function inputs F2...F1 are debounced for interference suppression. They have a fixed debouncing time. A signal must be applied for at least 10 msec. to allow a reliable identification.

The counting inputs D2 and D1 have a variable debouncing time which can be set in menu item 3 between 1 and 25 msec.. This may be necessary if interfacing is affected via contacts.

The debouncing time of the counting inputs influences the maximum counting frequency (see "Maximum counting frequency").

Maximum counting frequency

The H-phase (t_1) and the L phase (t_2) of the counting impulses must be equal to or larger than the debouncing time (t_d) set in menu item 3. Otherwise the counting impulses are not identified and counting will not be effected.



The maximum counting frequency is achieved when $t_1 = t_2 = t_d$.

If in menu item 3 the shortest debouncing time of 1 ms is set, the maximum counting frequency is at 500 Hz. On default setting of 5 ms the maximum counting frequency is at 100 Hz.

Multiplier/Divisor

In menu item 4 you can set a multiplier and in menu item 5 a divisor between 1 and 1000 each.

The display corresponds to the number of impulses counted, multiplied by the multiplier and divided by the divisor.

If a scaling is provided, let's say with the factor 2.91, as a multiplier 291 and as a divisor 100 are to be set.

Control functions

The signal inputs D6...D3 allow the following control functions:

Signal inputs		D6	D5	D4	D3
Stopping the counter	[5]	L	L	L	H
Stopping the display	[6]	L	L	H	L
Resetting the counter to zero	[7]	L	↑	L	L
Setting the counter to preset value	[8]	↑	L	L	L

↑ = rising edge of an impulse, L = L signal, H = H signal

Stopping the counter

With L signal on input D3 the impulses are counted according to the setting in menu item 1. With H signal the counting inputs are deactivated [5].

Stopping the display

With L signal at input D4 the display corresponds to the actual count of the counter. With H-signal the display stops (hold function), while the counter continues counting internally [6].

Resetting the counter to zero

The rising edge of an impulse at input D5 sets the counter to zero [7].

Setting the counter to preset value

The rising edge of an impulse at input D6 sets the counter to the preselected value [8] set in menu item 6. In menu item 6 *L PFD* and the actual setting alternately appear in the monitor display. Also the decimal points flash one after the other. The digit with the decimal point flashing can be set to the value requested by means of the menu key [↔]. The minus sign can be set in the left digit. It appears between 9 and 0.

For units with more than six digits setting of the preselected value is restricted to digit C6...C1. Settings in the digits C8 and C7 are possible via external coding switches (see Chapter 6) or the serial interface.

Function inputs

The terminals F2 and F1 are signal inputs (function inputs) or signal outputs (switching outputs), depending on the setting in menu item 9.

If setting fn is selected in menu item 9 the terminals F2 and F1 are function inputs. They allow the following functions:

Function inputs		F2	F1
Normal display	[9]	L	L
Flashing of the display (only with LED display)	[10]	L	H
Reduction of brightness (only with LED display)	[11]	H	L
Alternating display of the switching points	[12]	H	H

L = L-signal, H = H-signal

With L-signal on the inputs F1 and F2 the display is static and in normal brightness [9].

With H-signal on the input F1 and L-signal on the input F2 the display flashes [10].

With H-signal on input F2 and L-signal on input F1 the brightness of the display is reduced [11].

With H-signal on the inputs F1 and F2 the switching points set in menu item 7 and 8 appear alternatingly in the display [12].

For units with LRD[®] display flashing and reduction of brightness are not possible.

Switching outputs

The units have two switching outputs (relays) with potential-free make-contacts (output 1: CO1, NO1; Exit 2: CO2, NO2).

The switching point of output 1 is set in menu item 7 and the switching point of output 2 is set in menu item 8. In the menu display $rEL 1$ resp. $rEL 2$ and the current setting appear in turns. Also the decimal points flash one after the other. The digit with the decimal point flashing can be set to the value requested by means of the menu key. The minus sign can be set in the left digit. It appears between 9 and 0.

For units with more than six digits setting of the switching points is restricted to digit C6...C1. C1. Settings in the digits C8 and C7 are possible via external coding switches (see Chapter 6) or the serial interface.

The switching outputs are activated with a display value equal to or higher than the switching point set in the menu. The corresponding status indicator of the control computer (OUT1, OUT2) will light if the switching output is active.

If setting DUK is selected in menu item 9, the terminals F2 and F1 are additional electronic, bounce-free switching outputs (see Chapter 2, Function inputs). They are activated together with the relay.

The actual display value is compared. A decimal point set in menu item A is not considered.

The switching functions are not defined in the menu mode.

LED color

In menu items L1, L2 and L3 the LED color can be determined. The switching of the LED color is done automatically at the switching points of the switching outputs (only valid for units with switchable LED color).

Decimal point

A fixed decimal point can be set in menu item A.

Devices with LRD[®] display have no decimal points.

Leading zero suppression

In menu item C it is set if leading zeros are to be displayed or suppressed.

Display test

In menu item F, you can set whether a display test is to be performed after the operating voltage is applied.

Demo operation mode

If the setting *PLAY* is selected in menu item F, random characters are displayed. In this case, it is impossible to control the unit.

Data backup

In case of a failure of the operating voltage the count is saved. Once the operating voltage is restored the saved count will appear in the display. If a display test has been preselected in menu item F, it runs beforehand.

Serial interface

The units dispose of a galvanically isolated RS422 serial interface. It transmits the current display value as ASCII data telegram with final CR/LF (**xxxxxxxx<CR><LF>**) in intervals of approx. 0.25 s. The number of characters (x) is equal to the number of digits of the unit

The characters contain the current display value (right aligned) including the sign (left-aligned) or possibly overflow/underflow. The suppression of preceding zeros and a decimal point, which was set in menu item A are not taken into account.

The following commands can be transmitted to the display via the interface:

\$C<CR/LF>	Resetting the counter to zero
\$P<CR/LF>	Setting the counter to preset value
\$M<WERT><CR/LF>	Multiplier (0001...1000)
\$D<WERT><CR/LF>	Divisor (0001...1000)
\$R<WERT><CR/LF>	Preselection value (-9999999...00000000...99999999)
\$U<WERT><CR/LF>	Switching point 1 (-9999999...00000000...99999999)
\$L<WERT><CR/LF>	Switching point 2 (-9999999...00000000...99999999)
\$1<WERT><CR/LF>	LED color below both switching points (0, 1, 2)*
\$2<WERT><CR/LF>	LED color between the switching points (0, 1, 2)*
\$3<WERT><CR/LF>	LED color above both switching points (0, 1, 2)*

* 0 = red, 1 = orange, 2 = green

The telegram ending <CR/LF> may be a single <CR>, a single <LF> or the combination <CR><LF>.

Examples:

If switching point 2 is to be set to 20 the command is **\$L-20<CR>**.

If the LED color is to be set above both switching points to the color red the command is **\$30<CR>**.

The parameters of the serial interface are set as follows: 9600 9600 Baud, no parity, 8 data bits, 1 stop bit.

6 External coding switches

Application

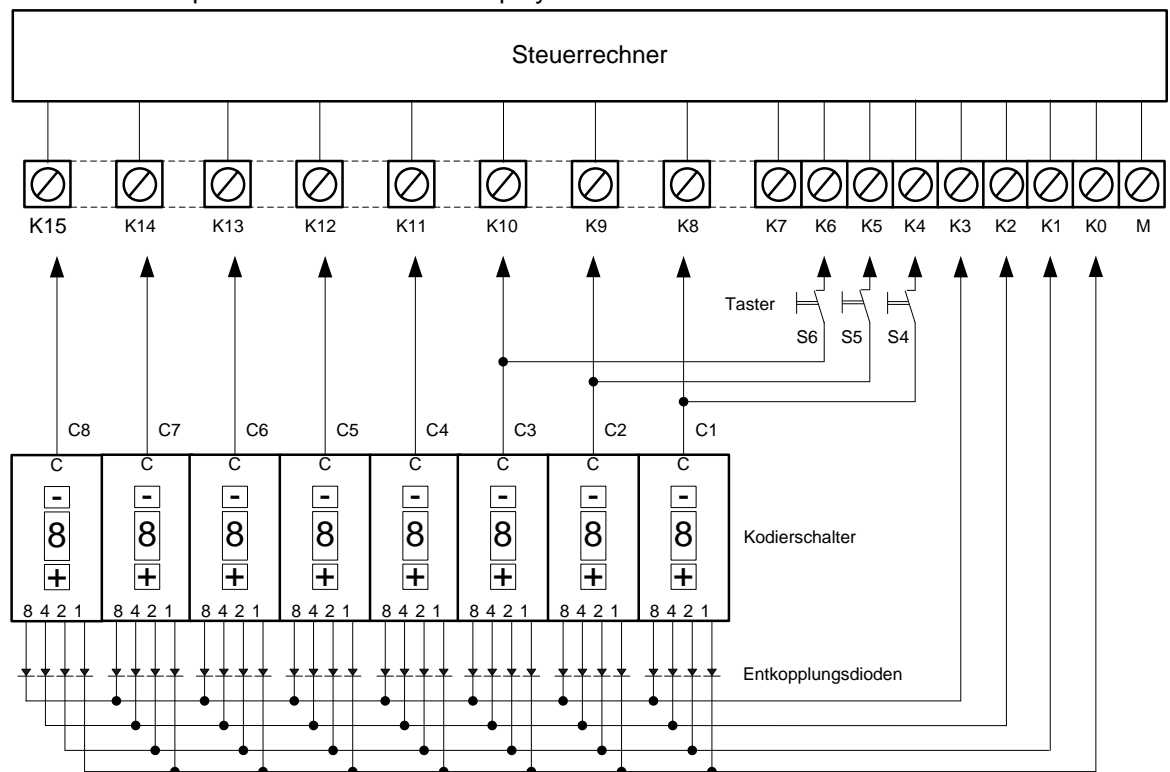
As described in chapter 5 the counter can be set to a preset value [8]. The preset value and the switching points of the switching outputs are set in the menu while the unit is open (see Chapter 7).

Should these settings be changeable during the operation with the unit closed, they must be external. This is possible with the unit types S302-xx/xx/xx-xxx/xx-Z1. They provide an interface extension for the connection of external coding switches and buttons (make contacts).

Coding switches with integrated de-coupling diodes are available as accessories. (Siebert P76A).

Circuit layout

The following figure shows the circuit layout for external coding switches and buttons. The coding switches correspond to C8...C1 of the display.

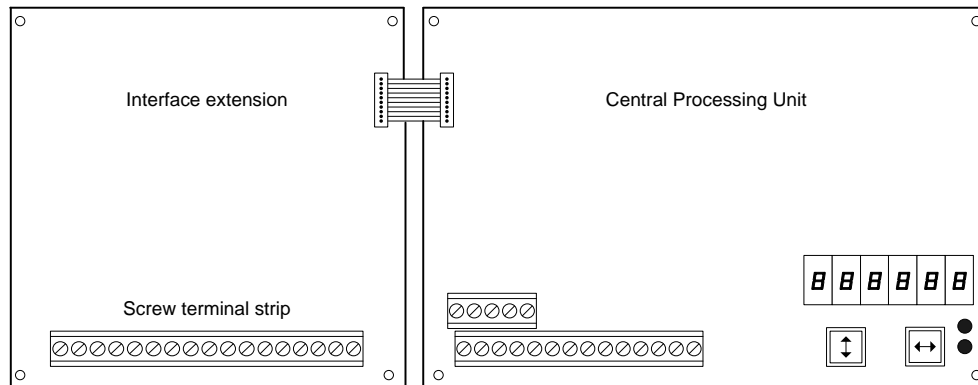


Terminal K7 is not to be used.

Steuerrechner	Central Processing Unit
Taster	button
Kodierschalter	coding switches
Entkopplungsdioden	de-coupling diodes

Interface extension

The following figure shows the Central Processing Unit with the interface extension:



Coding switch connections

The connections for the external coding switches and buttons (K15...K0) are located on the screw type terminal strip of the interface extension. They are exclusively determined for connecting the coding switches and buttons according to the circuit diagram.

Setting preset value

Closing button S4 sets the preset value to the value which has been adjusted to the coding switching. The setting in menu item 6 is then overwritten. At the same time the counter is set to preselect value.

For setting the counter to the preselect value by means of a control signal (z. g. PLC) signal input D6 of the control computer is to be used,

Adjusting the switching points

Closing button S5 sets the switching point of switching output 1 to the value which has been adjusted with the coding switches. The setting in menu item 7 is then overwritten.

Closing button S6 sets the switching point of switching output 2 to the value which has been adjusted with the coding switches. The setting in menu item 8 is then overwritten.

7 Parametrization

Menu

The parameterization of the devices is carried out in a menu in the menu display.

In normal mode digit C8 and C7 do not appear in the menu display.

Menu operation

To start the menu, press both menu buttons simultaneously (approx. 1 sec.) until the first menu item appears in the menu display. It is now possible to navigate in the menu as follows:

Next menu item	Shortly press key [↕]
Page menu items forward	Press key [↕] long
Previous menu item	Double-click on key [↕]
Page menu items backward	Double-click on key [↕] and keep it pressed
Next setting	Shortly press key [↔]
Page settings forward	Press key [↔] long
Previous setting	Double-click on key [↔]
Page setting backward	Double-click on key [↔] and keep it pressed

To exit the menu shortly press the key [↕] in menu item U. Depending on the setting in menu item U the settings made are either saved (set) or not saved (escape) or the factory settings are reset (default).

Canceling the menu without saving the settings made is possible by pressing both menu buttons simultaneously (approx. 1 sec.). It will occur automatically if 60 seconds pass without a menu button being pressed.

Once the menu is closed, the device behaves in the same manner as when the operating voltage was applied.

In the menu mode the character Ξ appears in the main display. Control of the display is not possible in menu mode.

Menu table

The menu items are displayed in the following menu table. The factory settings are marked with an *. Individual menu items or settings can be suppressed in another menu item, depending on the unit version or setting.

Menu item	Settings	Menu display
1 Counting functions	D2 = count direction ¹⁾ , D1 = counting input*	1 d i P
	D2 and D1 counting upward	1 u u
	D2 counting downward, D1 counting upward	1 d u
	D2 and D1 counting downward	1 d d
2 Edge	Counting with rising edge*	2 r iSE
	Counting with falling edge	2 FALL
3 Debouncing time of counting inputs D2, D1	1 ms (factory setting: 5 ms*)	3 01
	2 ms	3 02
	↓	↓
	25 ms	3 25
4 Multiplier	1*	4 0001
	2	4 0002
	↓	↓
	1000	4 1000
5 Divisor	1*	5 0001
	2	5 0002
	↓	↓
	1000	5 1000
6 Preselection counter ²⁾	-99999...000000*...999999	6 LoAd↔000000
7 Switching point 1 ²⁾	-99999...000000*...999999	7 rEL↔000000
8 Switching point 2 ²⁾	-99999...000000...999999	8 rEL2↔000000
9 Function inputs	F2, F1 = function inputs*	9 In
	F2, F1 = electronic switching outputs	9 Out
A Decimal point	No decimal point*	A 0
	Decimal point digit C1	A 1
	Decimal point digit C2	A 2
	↓	↓
	Decimal point digit C8	A 8
C Leading zeros	Leading zeros not displayed*	C 00
	Leading zeros displayed	C 0000
L1 LED color below both switching points	LED color red*	L1 rEd-----
	LED color orange	L1 YEL
	LED color green	L1 Grn
L2 LED color between the switching points	LED color red*	L2 rEd-----
	LED color orange	L2 YEL
	LED color green	L2 Grn
L3 LED color above both switching points	LED color red*	L3 rEd-----
	LED color orange	L3 YEL
	LED color green	L3 Grn
F Display test	No display test at power-on*	F ----
	Display test at power-on	F 8888
	Demo operation mode	F PLAY
U Save	Save parameters* (Set)	U SEt
	Not saving parameters (Escape)	U ESC
	Restore to factory settings (Default)	U dEF

¹⁾ L signal = counting upwards, H-Signal = counting downwards

²⁾ The setting range depends on the display range of the unit (see following table)

Display range	Unit version	Setting range	Factory setting switching point 2
2 digits	S302-x2/xx/xx-xxx/xx-xx	-9...00...99	10
3 digits	S302-x3/xx/xx-xxx/xx-xx	-99...000...999	100
4 digits	S302-x4/xx/xx-xxx/xx-xx	-999...0000...9999	1000
5 digits	S302-x5/xx/xx-xxx/xx-xx	-9999...00000...99999	10000
6 digits	S302-x6/xx/xx-xxx/xx-xx	-99999...000000...999999	100000
7 digits	S302-x7/xx/xx-xxx/xx-xx	-999999...000000...999999 ³⁾	100000
8 digits	S302-x8/xx/xx-xxx/xx-xx	-999999...000000...999999 ³⁾	100000

³⁾ Settings in the digits C8 and C7 are possible via external coding switches (see Chapter 6) or the serial interface (see Chapter 5).

8 Technical data

Unit properties

The model designation is structured as follows:

S302	-	<input type="text"/>	/	<input type="text"/>	/	<input type="text"/>	-	<input type="text"/>	/	<input type="text"/>	-	<input type="text"/>
No dimension symbol	0	:	:	:	:	:	:	:	:	:	:	:
Dimension symbol	F	:	:	:	:	:	:	:	:	:	:	:
1 Digit	1	:	:	:	:	:	:	:	:	:	:	:
2 Digits	2	:	:	:	:	:	:	:	:	:	:	:
↓	↓	:	:	:	:	:	:	:	:	:	:	:
8 Digits	8	:	:	:	:	:	:	:	:	:	:	:
Character height 57 mm	0 6	:	:	:	:	:	:	:	:	:	:	:
Character height 100 mm	1 0	:	:	:	:	:	:	:	:	:	:	:
Character height 160 mm	1 6	:	:	:	:	:	:	:	:	:	:	:
Character height 250 mm	2 5	:	:	:	:	:	:	:	:	:	:	:
LED Standard	0	:	:	:	:	:	:	:	:	:	:	:
LED for outdoor use	2	:	:	:	:	:	:	:	:	:	:	:
LRD [®]	4	:	:	:	:	:	:	:	:	:	:	:
Character color red	R	:	:	:	:	:	:	:	:	:	:	:
Character color green	G	:	:	:	:	:	:	:	:	:	:	:
Character color white	W	:	:	:	:	:	:	:	:	:	:	:
Character color red/green/orange switchable	M	:	:	:	:	:	:	:	:	:	:	:
Display readable on one side	1	:	:	:	:	:	:	:	:	:	:	:
Display readable on both sides	2	:	:	:	:	:	:	:	:	:	:	:
Steel sheet housing, coated	0	:	:	:	:	:	:	:	:	:	:	:
Steel sheet housing, bilayer painting	1	:	:	:	:	:	:	:	:	:	:	:
Stainless steel housing V2A, coated	2	:	:	:	:	:	:	:	:	:	:	:
Stainless steel housing V2A, brushed	3	:	:	:	:	:	:	:	:	:	:	:
Stainless steel housing V4A, brushed	5	:	:	:	:	:	:	:	:	:	:	:
Protection type IP54	0	:	:	:	:	:	:	:	:	:	:	:
Protection type IP65	1	:	:	:	:	:	:	:	:	:	:	:
Protection type IP54 with climate adjustment	2	:	:	:	:	:	:	:	:	:	:	:
Protection type IP54 with climate adjustment and heating	4	:	:	:	:	:	:	:	:	:	:	:
Wall mounting, cable entry point from the bottom	0	:	:	:	:	:	:	:	:	:	:	:
Wall mounting, cable entry point from the top	1	:	:	:	:	:	:	:	:	:	:	:
Hanging installation, cable entry point from the bottom	2	:	:	:	:	:	:	:	:	:	:	:
Hanging installation, cable entry point from the top	3	:	:	:	:	:	:	:	:	:	:	:
Wall mounting and hanging installation, cable entry point from the bottom	4	:	:	:	:	:	:	:	:	:	:	:
Wall mounting and hanging installation, cable entry point from the top	5	:	:	:	:	:	:	:	:	:	:	:
Power supply 230 V AC ±15 %, 50 Hz	A	:	:	:	:	:	:	:	:	:	:	:
Power supply 24 V DC ±15 %	B	:	:	:	:	:	:	:	:	:	:	:
Power supply 115 V AC ±15 %, 60 Hz	C	:	:	:	:	:	:	:	:	:	:	:
Standard devices	Z 0	:	:	:	:	:	:	:	:	:	:	:
Devices with interface extension for external coding switches	Z 1	:	:	:	:	:	:	:	:	:	:	:

Max. power consumption

Units with one-sided display	
1 digit	
S302-x1/10/0x-1xx/xx-xx	approx. 12 VA
S302-x1/10/4x-1xx/xx-xx	approx. 50 VA
S302-x1/16/0x-1xx/xx-xx	approx. 22 VA
S302-x1/16/4x-1xx/xx-xx	approx. 50 VA
S302-x1/25/0x-1xx/xx-xx	approx. 26 VA
S302-x1/25/4x-1xx/xx-xx	approx. 85 VA
2 digits	
S302-x2/06/0x-1xx/xx-xx	approx. 12 VA
S302-x2/10/0x-1xx/xx-xx	approx. 15 VA
S302-x2/10/4x-1xx/xx-xx	approx. 50 VA
S302-x2/16/0x-1xx/xx-xx	approx. 37 VA
S302-x2/16/4x-1xx/xx-xx	approx. 50 VA
S302-x2/25/0x-1xx/xx-xx	approx. 46 VA
S302-x2/25/4x-1xx/xx-xx	approx. 85 VA
3 digits	
S302-x3/06/0x-1xx/xx-xx	approx. 13 VA
S302-x3/10/0x-1xx/xx-xx	approx. 17 VA
S302-x3/10/4x-1xx/xx-xx	approx. 50 VA
S302-x3/16/0x-1xx/xx-xx	approx. 51 VA
S302-x3/16/4x-1xx/xx-xx	approx. 50 VA
S302-x3/25/0x-1xx/xx-xx	approx. 63 VA
S302-x3/25/4x-1xx/xx-xx	approx. 85 VA
4 digits	
S302-x4/06/0x-1xx/xx-xx	approx. 14 VA
S302-x4/10/0x-1xx/xx-xx	approx. 21 VA
S302-x4/10/4x-1xx/xx-xx	approx. 50 VA
S302-x4/16/0x-1xx/xx-xx	approx. 64 VA
S302-x4/16/4x-1xx/xx-xx	approx. 50 VA
S302-x4/25/0x-1xx/xx-xx	approx. 79 VA
S302-x4/25/4x-1xx/xx-xx	approx. 85 VA
5 digits	
S302-x5/06/0x-1xx/xx-xx	approx. 15 VA
S302-x5/10/0x-1xx/xx-xx	approx. 23 VA
S302-x5/10/4x-1xx/xx-xx	approx. 50 VA
S302-x5/16/0x-1xx/xx-xx	approx. 77 VA
S302-x5/16/4x-1xx/xx-xx	approx. 50 VA
S302-x5/25/0x-1xx/xx-xx	approx. 96 VA
S302-x5/25/4x-1xx/xx-xx	approx. 85 VA
6 digits	
S302-x6/06/0x-1xx/xx-xx	approx. 16 VA
S302-x6/10/0x-1xx/xx-xx	approx. 26 VA
S302-x6/10/4x-1xx/xx-xx	approx. 50 VA
S302-x6/16/0x-1xx/xx-xx	approx. 91 VA
S302-x6/16/4x-1xx/xx-xx	approx. 50 VA
S302-x6/25/0x-1xx/xx-xx	approx. 113 VA
S302-x6/25/4x-1xx/xx-xx	approx. 85 VA
7 digits	
S302-x7/06/0x-1xx/xx-xx	approx. 17 VA
S302-x7/10/0x-1xx/xx-xx	approx. 30 VA
S302-x7/10/4x-1xx/xx-xx	approx. 50 VA
S302-x7/16/0x-1xx/xx-xx	approx. 104 VA
S302-x7/16/4x-1xx/xx-xx	approx. 50 VA
S302-x7/25/0x-1xx/xx-xx	approx. 130 VA
S302-x7/25/4x-1xx/xx-xx	approx. 85 VA
8 digits	
S302-x8/06/0x-1xx/xx-xx	approx. 18 VA
S302-x8/10/0x-1xx/xx-xx	approx. 32 VA
S302-x8/10/4x-1xx/xx-xx	approx. 50 VA

Units with double-sided display	
1 digits	
S302-x1/10/0x-2xx/xx-xx	approx. 16 VA
S302-x1/10/4x-2xx/xx-xx	approx. 91 VA
S302-x1/16/0x-2xx/xx-xx	approx. 35 VA
S302-x1/16/4x-2xx/xx-xx	approx. 91 VA
S302-x1/25/0x-2xx/xx-xx	approx. 42 VA
S302-x1/25/4x-2xx/xx-xx	approx. 164 VA
2 digits	
S302-x2/06/0x-2xx/xx-xx	approx. 15 VA
S302-x2/10/0x-2xx/xx-xx	approx. 21 VA
S302-x2/10/4x-2xx/xx-xx	approx. 91 VA
S302-x2/16/0x-2xx/xx-xx	approx. 66 VA
S302-x2/16/4x-2xx/xx-xx	approx. 91 VA
S302-x2/25/0x-2xx/xx-xx	approx. 83 VA
S302-x2/25/4x-2xx/xx-xx	approx. 164 VA
3 digits	
S302-x3/06/0x-2xx/xx-xx	approx. 17 VA
S302-x3/10/0x-2xx/xx-xx	approx. 26 VA
S302-x3/10/4x-2xx/xx-xx	approx. 91 VA
S302-x3/16/0x-2xx/xx-xx	approx. 92 VA
S302-x3/16/4x-2xx/xx-xx	approx. 91 VA
S302-x3/25/0x-2xx/xx-xx	approx. 116 VA
S302-x3/25/4x-2xx/xx-xx	approx. 164 VA
4 digits	
S302-x4/06/0x-2xx/xx-xx	approx. 19 VA
S302-x4/10/0x-2xx/xx-xx	approx. 33 VA
S302-x4/10/4x-2xx/xx-xx	approx. 91 VA
S302-x4/16/0x-2xx/xx-xx	approx. 119 VA
S302-x4/16/4x-2xx/xx-xx	approx. 91 VA
S302-x4/25/0x-2xx/xx-xx	approx. 150 VA
S302-x4/25/4x-2xx/xx-xx	approx. 164 VA
5 digits	
S302-x5/06/0x-2xx/xx-xx	approx. 21 VA
S302-x5/10/0x-2xx/xx-xx	approx. 38 VA
S302-x5/10/4x-2xx/xx-xx	approx. 91 VA
S302-x5/16/0x-2xx/xx-xx	approx. 146 VA
S302-x5/16/4x-2xx/xx-xx	approx. 91 VA
S302-x5/25/0x-2xx/xx-xx	approx. 184 VA
S302-x5/25/4x-2xx/xx-xx	approx. 164 VA
6 digits	
S302-x6/06/0x-2xx/xx-xx	approx. 23 VA
S302-x6/10/0x-2xx/xx-xx	approx. 43 VA
S302-x6/10/4x-2xx/xx-xx	approx. 91 VA
S302-x6/16/0x-2xx/xx-xx	approx. 173 VA
S302-x6/16/4x-2xx/xx-xx	approx. 91 VA
S302-x6/25/0x-2xx/xx-xx	approx. 217 VA
S302-x6/25/4x-2xx/xx-xx	approx. 164 VA
7 digits	
S302-x7/06/0x-2xx/xx-xx	approx. 25 VA
S302-x7/10/0x-2xx/xx-xx	approx. 51 VA
S302-x7/10/4x-2xx/xx-xx	approx. 91 VA
S302-x7/16/0x-2xx/xx-xx	approx. 200 VA
S302-x7/16/4x-2xx/xx-xx	approx. 91 VA
S302-x7/25/0x-2xx/xx-xx	approx. 250 VA
S302-x7/25/4x-2xx/xx-xx	approx. 164 VA
8 digits	
S302-x8/06/0x-2xx/xx-xx	approx. 27 VA
S302-x8/10/0x-2xx/xx-xx	approx. 55 VA
S302-x8/10/4x-2xx/xx-xx	approx. 91 VA

The power consumption for the device model S302-xx/xx/0x-xxx/xx-xx is also valid for the device model S302-xx/xx/2x-xxx/xx-xx (LEDs for external use).

For units with built-in heating, the values for power consumption specified in the table increase by approx. 10 – 100 VA (exact values on request), depending on the unit size).

Switching output

Maximum switching voltage 30 V AC/DC
 Maximum switching current 500 mA (ohmic load)

Screw-type terminals

Control computer	Capacity of terminals 0,14...1,5 mm ²
Power supply	Capacity of terminals 0,2...4 mm ²

Housing colors

Case front	RAL 5002 ultramarine
Case rear part	RAL 7035 light grey

Front frame

S302-xx/xx/xR-xxx/xx-xx	Plastic, tinted red, non-reflective
S302-xx/06/xG-xxx/xx-xx	Plastic, tinted green, non-reflective
S302-xx/10/xG-xxx/xx-xx	Plastic, tinted green, non-reflective
Other model types	Plastic, clear, non-reflective

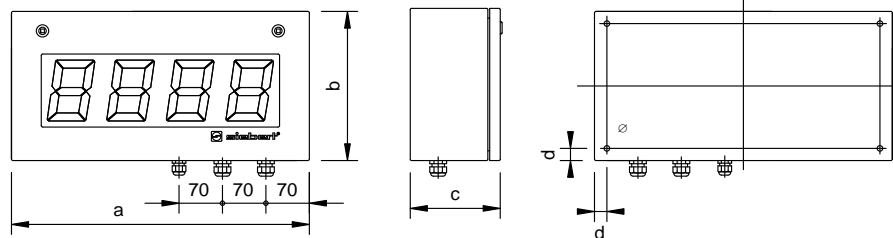
Ambient conditions

Operating temperature	0...55 °C
Storage temperature	-30...85 °C
Relative humidity	max. 95 % (non-condensing)

Measurements and weights

Units with one-sided display

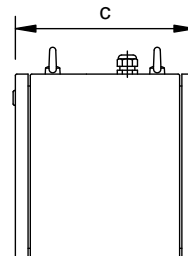
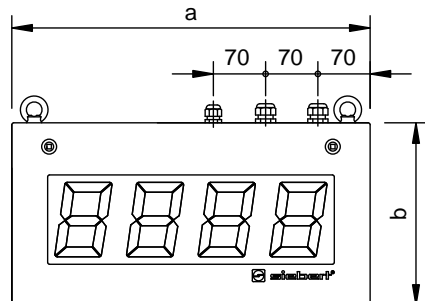
The following figure shows unit version S302-04/10/4x-1xx/xx-xx, representing the other unit versions listed in the following table.



1 digit	a	b	c	d	Ø	Weight
S302-01/10/xx-1xx/xx-xx	330 mm	245 mm	145 mm	16 mm	7 mm	approx. 7 kg
S302-01/16/xx-1xx/xx-xx	390 mm	300 mm	145 mm	20 mm	9 mm	approx. 9 kg
S302-01/25/xx-1xx/xx-xx	570 mm	400 mm	165 mm	20 mm	9 mm	approx. 14 kg
2 digits						
S302-02/06/xx-1xx/xx-xx	300 mm	185 mm	110 mm	16 mm	7 mm	approx. 5 kg
S302-02/10/xx-1xx/xx-xx	330 mm	245 mm	145 mm	16 mm	7 mm	approx. 7 kg
S302-02/16/xx-1xx/xx-xx	390 mm	300 mm	145 mm	20 mm	9 mm	approx. 9 kg
S302-02/25/xx-1xx/xx-xx	570 mm	400 mm	165 mm	20 mm	9 mm	approx. 14 kg
3 digits						
S302-03/06/xx-1xx/xx-xx	300 mm	185 mm	110 mm	16 mm	7 mm	approx. 5 kg
S302-03/10/xx-1xx/xx-xx	480 mm	245 mm	145 mm	16 mm	7 mm	approx. 9 kg
S302-03/16/xx-1xx/xx-xx	670 mm	300 mm	145 mm	20 mm	9 mm	approx. 13 kg
S302-03/25/xx-1xx/xx-xx	1030 mm	400 mm	165 mm	20 mm	9 mm	approx. 23 kg
4 digits						
S302-04/06/xx-1xx/xx-xx	300 mm	185 mm	110 mm	16 mm	7 mm	approx. 5 kg
S302-04/10/xx-1xx/xx-xx	480 mm	245 mm	145 mm	16 mm	7 mm	approx. 9 kg
S302-04/16/xx-1xx/xx-xx	670 mm	300 mm	145 mm	20 mm	9 mm	approx. 13 kg
S302-04/25/xx-1xx/xx-xx	1030 mm	400 mm	165 mm	20 mm	9 mm	approx. 23 kg
5 digits						
S302-05/06/xx-1xx/xx-xx	400 mm	185 mm	110 mm	16 mm	7 mm	approx. 6 kg
S302-05/10/xx-1xx/xx-xx	680 mm	245 mm	145 mm	16 mm	7 mm	approx. 12 kg
S302-05/16/xx-1xx/xx-xx	960 mm	300 mm	145 mm	20 mm	9 mm	approx. 17 kg
S302-05/25/xx-1xx/xx-xx	1500 mm	400 mm	165 mm	20 mm	9 mm	approx. 32 kg
6 digits						
S302-06/06/xx-1xx/xx-xx	400 mm	185 mm	110 mm	16 mm	7 mm	approx. 6 kg
S302-06/10/xx-1xx/xx-xx	680 mm	245 mm	145 mm	16 mm	7 mm	approx. 12 kg
S302-06/16/xx-1xx/xx-xx	960 mm	300 mm	145 mm	20 mm	9 mm	approx. 17 kg
S302-06/25/xx-1xx/xx-xx	1500 mm	400 mm	165 mm	20 mm	9 mm	approx. 32 kg
7 digits						
S302-07/06/xx-1xx/xx-xx	510 mm	185 mm	110 mm	16 mm	7 mm	approx. 7 kg
S302-07/10/xx-1xx/xx-xx	870 mm	245 mm	145 mm	16 mm	7 mm	approx. 14 kg
S302-07/16/xx-1xx/xx-xx	1100 mm	300 mm	145 mm	20 mm	9 mm	approx. 20 kg
S302-07/25/xx-1xx/xx-xx	1730 mm	400 mm	165 mm	20 mm	9 mm	approx. 37 kg
8 digits						
S302-08/06/xx-1xx/xx-xx	510 mm	185 mm	110 mm	16 mm	7 mm	approx. 7 kg
S302-08/10/xx-1xx/xx-xx	870 mm	245 mm	145 mm	16 mm	7 mm	approx. 14 kg

Units with double-sided display

The following figure shows unit version S302-04/10/4x-2xx/xx-xx, representing the other unit versions listed in the following table.

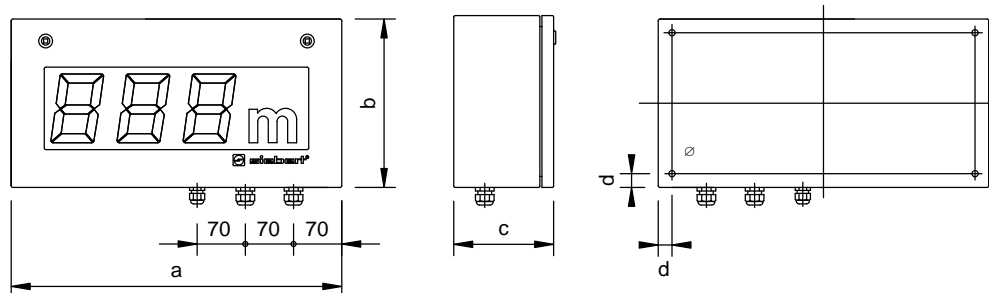


Units with character height of 57 mm (S302-xx/06/xx-2xx/xx-xx) are provided with 2 eyes instead of 4

1 digit	a	b	c	Weight
S302-01/10/xx-2xx/xx-xx	330 mm	245 mm	240 mm	approx. 11 kg
S302-01/16/xx-2xx/xx-xx	390 mm	300 mm	240 mm	approx. 12 kg
S302-01/25/xx-2xx/xx-xx	570 mm	400 mm	270 mm	approx. 21 kg
2 digits				
S302-02/06/xx-2xx/xx-xx	300 mm	185 mm	150 mm	approx. 9 kg
S302-02/10/xx-2xx/xx-xx	330 mm	245 mm	240 mm	approx. 11 kg
S302-02/16/xx-2xx/xx-xx	390 mm	300 mm	240 mm	approx. 12 kg
S302-02/25/xx-2xx/xx-xx	570 mm	400 mm	270 mm	approx. 22 kg
3 digits				
S302-03/06/xx-2xx/xx-xx	300 mm	185 mm	150 mm	approx. 9 kg
S302-03/10/xx-2xx/xx-xx	480 mm	245 mm	240 mm	approx. 15 kg
S302-03/16/xx-2xx/xx-xx	670 mm	300 mm	240 mm	approx. 19 kg
S302-03/25/xx-2xx/xx-xx	1030 mm	400 mm	270 mm	approx. 33 kg
4 digits				
S302-04/06/xx-2xx/xx-xx	300 mm	185 mm	150 mm	approx. 9 kg
S302-04/10/xx-2xx/xx-xx	480 mm	245 mm	240 mm	approx. 15 kg
S302-04/16/xx-2xx/xx-xx	670 mm	300 mm	240 mm	approx. 20 kg
S302-04/25/xx-2xx/xx-xx	1030 mm	400 mm	270 mm	approx. 34 kg
5 digits				
S302-05/06/xx-2xx/xx-xx	400 mm	185 mm	150 mm	approx. 9 kg
S302-05/10/xx-2xx/xx-xx	680 mm	245 mm	240 mm	approx. 19 kg
S302-05/16/xx-2xx/xx-xx	960 mm	300 mm	240 mm	approx. 26 kg
S302-05/25/xx-2xx/xx-xx	1500 mm	400 mm	270 mm	approx. 45 kg
6 digits				
S302-06/06/xx-2xx/xx-xx	400 mm	185 mm	150 mm	approx. 9 kg
S302-06/10/xx-2xx/xx-xx	680 mm	245 mm	240 mm	approx. 19 kg
S302-06/16/xx-2xx/xx-xx	960 mm	300 mm	240 mm	approx. 27 kg
S302-06/25/xx-2xx/xx-xx	1500 mm	400 mm	270 mm	approx. 46 kg
7 digits				
S302-07/06/xx-2xx/xx-xx	510 mm	185 mm	150 mm	approx. 11 kg
S302-07/10/xx-2xx/xx-xx	870 mm	245 mm	240 mm	approx. 23 kg
S302-07/16/xx-2xx/xx-xx	1100 mm	300 mm	240 mm	approx. 29 kg
S302-07/25/xx-2xx/xx-xx	1730 mm	400 mm	270 mm	approx. 52 kg
8 digits				
S302-08/06/xx-2xx/xx-xx	510 mm	185 mm	150 mm	approx. 11 kg
S302-08/10/xx-2xx/xx-xx	870 mm	245 mm	240 mm	approx. 23 kg

Units with one-sided display and dimension symbol

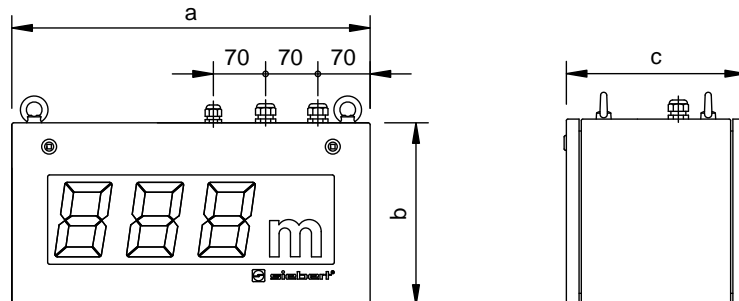
The following figure shows unit version S302-F3/10/4x-1xx/xx-xx, representing the other unit versions listed in the following table.



1 digit + dimension	a	b	c	d	Ø	Weight
S302-F1/10/xx-1xx/xx-xx	330 mm	245 mm	145 mm	16 mm	7 mm	approx. 7 kg
S302-F1/16/xx-1xx/xx-xx	390 mm	300 mm	145 mm	20 mm	9 mm	approx. 9 kg
S302-F1/25/xx-1xx/xx-xx	570 mm	400 mm	165 mm	20 mm	9 mm	approx. 14 kg
2 digits + dimension						
S302-F2/06/xx-1xx/xx-xx	300 mm	185 mm	110 mm	16 mm	7 mm	approx. 5 kg
S302-F2/10/xx-1xx/xx-xx	480 mm	245 mm	145 mm	16 mm	7 mm	approx. 9 kg
S302-F2/16/xx-1xx/xx-xx	670 mm	300 mm	145 mm	20 mm	9 mm	approx. 13 kg
S302-F2/25/xx-1xx/xx-xx	1030 mm	400 mm	165 mm	20 mm	9 mm	approx. 23 kg
3 digits + dimension						
S302-F3/06/xx-1xx/xx-xx	300 mm	185 mm	110 mm	16 mm	7 mm	approx. 5 kg
S302-F3/10/xx-1xx/xx-xx	480 mm	245 mm	145 mm	16 mm	7 mm	approx. 9 kg
S302-F3/16/xx-1xx/xx-xx	670 mm	300 mm	145 mm	20 mm	9 mm	approx. 13 kg
S302-F3/25/xx-1xx/xx-xx	1030 mm	400 mm	165 mm	20 mm	9 mm	approx. 23 kg
4 digits + dimension						
S302-F4/06/xx-1xx/xx-xx	400 mm	185 mm	110 mm	16 mm	7 mm	approx. 6 kg
S302-F4/10/xx-1xx/xx-xx	680 mm	245 mm	145 mm	16 mm	7 mm	approx. 12 kg
S302-F4/16/xx-1xx/xx-xx	960 mm	300 mm	145 mm	20 mm	9 mm	approx. 17 kg
S302-F4/25/xx-1xx/xx-xx	1500 mm	400 mm	165 mm	20 mm	9 mm	approx. 32 kg
5 digits + dimension						
S302-F5/06/xx-1xx/xx-xx	400 mm	185 mm	110 mm	16 mm	7 mm	approx. 6 kg
S302-F5/10/xx-1xx/xx-xx	680 mm	245 mm	145 mm	16 mm	7 mm	approx. 12 kg
S302-F5/16/xx-1xx/xx-xx	960 mm	300 mm	145 mm	20 mm	9 mm	approx. 17 kg
S302-F5/25/xx-1xx/xx-xx	1500 mm	400 mm	165 mm	20 mm	9 mm	approx. 32 kg
6 digits + dimension						
S302-F6/06/xx-1xx/xx-xx	510 mm	185 mm	110 mm	16 mm	7 mm	approx. 7 kg
S302-F6/10/xx-1xx/xx-xx	870 mm	245 mm	145 mm	16 mm	7 mm	approx. 14 kg
S302-F6/16/xx-1xx/xx-xx	1100 mm	300 mm	145 mm	20 mm	9 mm	approx. 20 kg
S302-F6/25/xx-1xx/xx-xx	1730 mm	400 mm	165 mm	20 mm	9 mm	approx. 37 kg
7 digits + dimension						
S302-F7/06/xx-1xx/xx-xx	510 mm	185 mm	110 mm	16 mm	7 mm	approx. 7 kg
S302-F7/10/xx-1xx/xx-xx	870 mm	245 mm	145 mm	16 mm	7 mm	approx. 14 kg

Units with double-sided display and dimension symbol

The following figure shows unit version S302-F3/10/4x-2xx/xx-xx, representing the other unit versions listed in the following table.



Units with character height of 57 mm (S302-xx/06/xx-2xx/xx-xx) are provided with 2 eyes instead of 4

1 digit + dimension	a	b	c	Weight
S302-F1/10/xx-2xx/xx-xx	330 mm	245 mm	240 mm	approx. 11 kg
S302-F1/16/xx-2xx/xx-xx	390 mm	300 mm	240 mm	approx. 12 kg
S302-F1/25/xx-2xx/xx-xx	570 mm	400 mm	270 mm	approx. 21 kg
2 digits + dimension				
S302-F2/06/xx-2xx/xx-xx	300 mm	185 mm	150 mm	approx. 9 kg
S302-F2/10/xx-2xx/xx-xx	480 mm	245 mm	240 mm	approx. 15 kg
S302-F2/16/xx-2xx/xx-xx	670 mm	300 mm	240 mm	approx. 18 kg
S302-F2/25/xx-2xx/xx-xx	1030 mm	400 mm	270 mm	approx. 32 kg
3 digits + dimension				
S302-F3/06/xx-2xx/xx-xx	300 mm	185 mm	150 mm	approx. 9 kg
S302-F3/10/xx-2xx/xx-xx	480 mm	245 mm	240 mm	approx. 15 kg
S302-F3/16/xx-2xx/xx-xx	670 mm	300 mm	240 mm	approx. 19 kg
S302-F3/25/xx-2xx/xx-xx	1030 mm	400 mm	270 mm	approx. 33 kg
4 digits + dimension				
S302-F4/06/xx-2xx/xx-xx	400 mm	185 mm	150 mm	approx. 9 kg
S302-F4/10/xx-2xx/xx-xx	680 mm	245 mm	240 mm	approx. 19 kg
S302-F4/16/xx-2xx/xx-xx	960 mm	300 mm	240 mm	approx. 25 kg
S302-F4/25/xx-2xx/xx-xx	1500 mm	400 mm	270 mm	approx. 44 kg
5 digits + dimension				
S302-F5/06/xx-2xx/xx-xx	400 mm	185 mm	150 mm	approx. 9 kg
S302-F5/10/xx-2xx/xx-xx	680 mm	245 mm	240 mm	approx. 19 kg
S302-F5/16/xx-2xx/xx-xx	960 mm	300 mm	240 mm	approx. 26 kg
S302-F5/25/xx-2xx/xx-xx	1500 mm	400 mm	270 mm	approx. 45 kg
6 digits + dimension				
S302-F6/06/xx-2xx/xx-xx	510 mm	185 mm	150 mm	approx. 11 kg
S302-F6/10/xx-2xx/xx-xx	870 mm	245 mm	240 mm	approx. 23 kg
S302-F6/16/xx-2xx/xx-xx	1100 mm	300 mm	240 mm	approx. 29 kg
S302-F6/25/xx-2xx/xx-xx	1730 mm	400 mm	270 mm	approx. 52 kg
7 digits + dimension				
S302-F7/06/xx-2xx/xx-xx	510 mm	185 mm	150 mm	approx. 11kg
S302-F7/10/xx-2xx/xx-xx	870 mm	245 mm	240 mm	approx. 23 kg