Operating instructions

Series S302

Numeric large size displays with programmable timer functions

1 Contact

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2 Legal note

This operation manual has been prepared with the utmost care. However, we do not accept any liability for possible errors. We always appreciate your suggestions for improvement, corrections, comments and proposals. Please contact us: editing@siebert-group.com

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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.

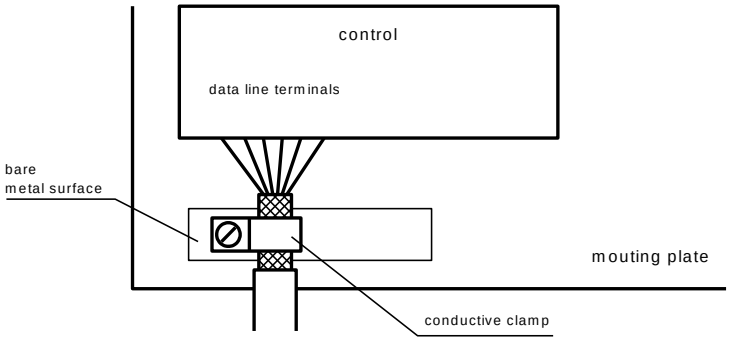
The data and operating voltage cables must be laid separately. They may not be laid together with heavy-current cables or other interference-producing cables.

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. 0.1µF/600 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

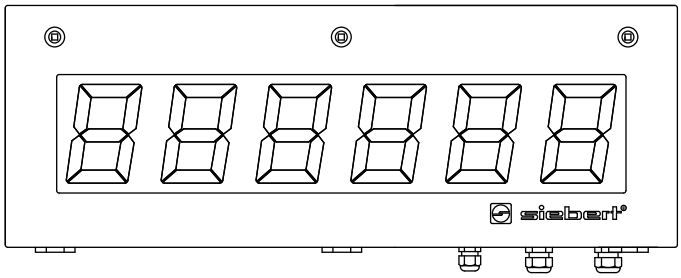
Model designation

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 7):

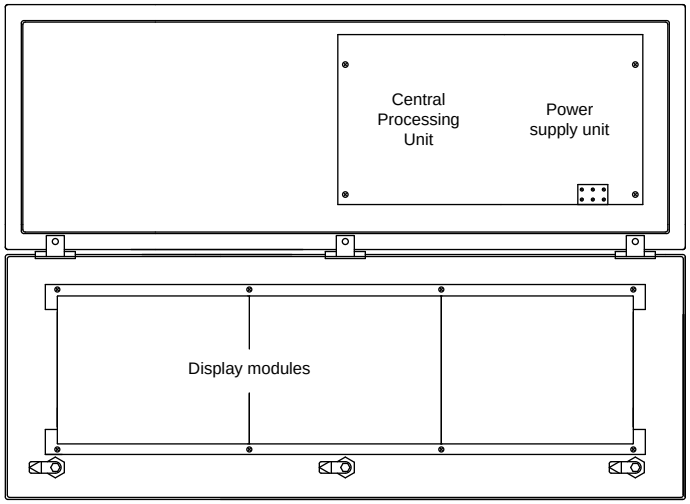
S302-xx/xx/xx-xxx/xx-U0
S302-xx/xx/xx-xxx/xx-U1(with interface extension for external coding switches, see Chapter 8).

Unit construction

The following figure shows model type S302-06/10/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.

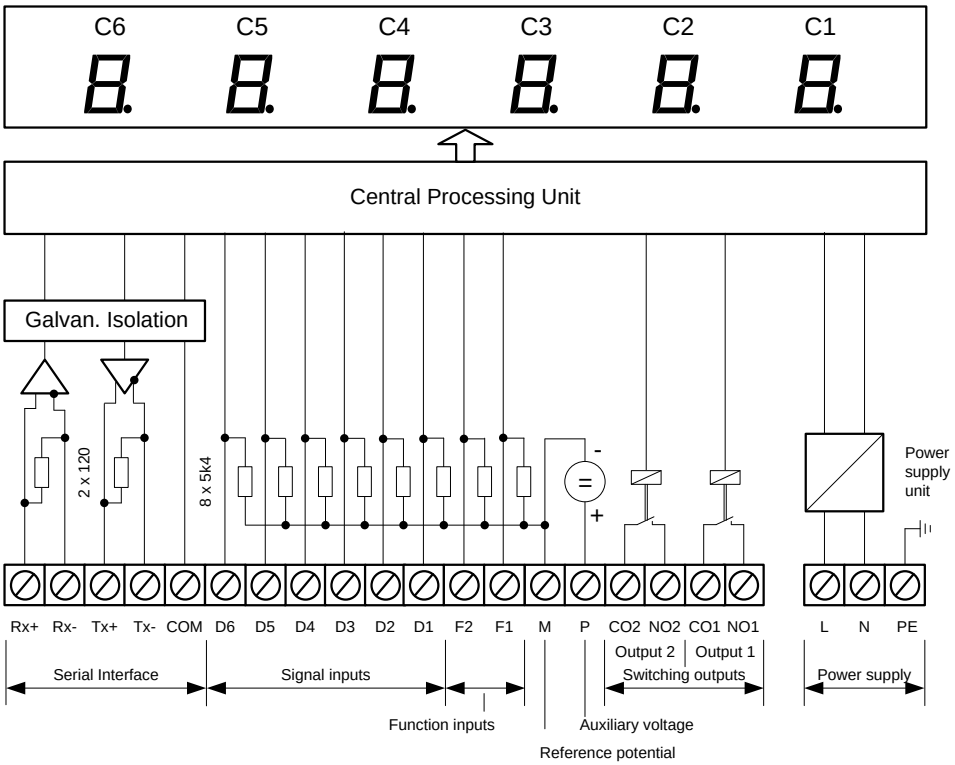


The following figure shows the unit when open.



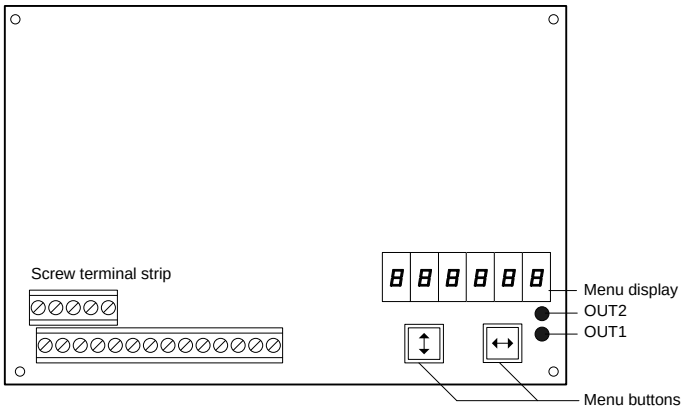
Units with double-sided display show the same information on the front and on the rear side.

Principle circuit diagram



Central Processing Unit

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



Signal inputs

The signal inputs are located on the screw type terminal strip of the control computer. They are 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 function inputs are located on the screw-type terminal strip of the control computer. They allow reduction in brightness and flashing of the display (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

Auxiliary voltage

The units supply terminal P with an auxiliary voltage galvanically isolated from the operating voltage (24 V ± 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 6).In normal mode, the menu display corresponds to the main display. For devices with more than six positions, OnlinE is shown in the menu display in normal operation.

Menu buttons

The menu buttons are used to control the menu (see Chapter 6).

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 $\square$ (overflow) in case of a display overrange and a $\sqcup$ (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 Functions

In the following description, the numbers in [ ] refer to the corresponding lines in the function table.

Features

The timer can count downwards starting from a programmed start value or count upwards starting from zero. Various display formats are possible.

The further timer behavior when reaching zero (counting downwards) resp. when reaching the programmed stop value (counting upwards) can be set.

Having two switching outputs (relay with potential-free contacts), the timer can carry out signaling functions and control functions. The switching points and the behavior of the switching outputs can be set individually.

The signal inputs can be used to start the timer, to interrupt or continue the counting function and to acknowledge the switching outputs.

For units with interface extension (see Chapter 7), the start resp. stop value and the switching points can be set via external coding switches.

For units with switchable LED color an automatic switch over of the LED color can be performed at the switching points.

Parameterization

The parameterization of the units is done with a menu in the menu display (see Chapter 6).

Control functions

The signal inputs D6...D1 allow the following control functions:

Signal inputs		**D6**	**D5**	**D4**	**D3**	**D2**	**D1**
Start timer	[1]	X	X	X	X	X	↑
Static stop of timer	[2]	X	X	X	X	H	X
Dynamical stop of timer	[3]	X	X	X	↑	X	X
Dynamical release of timer	[4]	X	X	↑	X	X	X
Acknowledging switching output 1	[5]	X	↑	X	X	X	X
Acknowledging switching output 2	[6]	↑	X	X	X	X	X

↑.= Rising edge of pulses L = L-Signal, H = H-Signal, X = L- or H-Signal

Starting the timer

The rising edge of an impulse at input D1 starts the timer.

When setting dEc in menu item 2 the timer is adjusted to the start value which is set in menu item 3 (see Chapter 6) and counts downward [1].

When setting Inc in menu item 2 the timer is set to zero and counts upwards.

When the timer starts, the contacts of the switching outputs change to their idle position.

Static stop of timer

An H-signal at the input D2 stops the timer. The current value is maintained.

An L-signal at the input D2 releases the timer. If the timer is not dynamically stopped by an impulse edge at the input D3, the count continues [2].

Dynamical stop of the timer

The rising edge of an impulse at input D3 stops the timer. The current value is maintained [3].

The rising edge of an impulse at input D4 releases the timer. If the timer is not statically stopped by an H-signal at the input D2, the time counting continues [4].

Acknowledging the switching outputs

The rising edge of an impulse at the input D5 acknowledges the switching output 1. The contact of the switching output changes to its idle position [5].

The rising edge of an impulse at the input D6 acknowledges the switching output 2. The contact of the switching output changes to its idle position [6].

Function inputs

The function inputs allow the following functions:

Function inputs		**F2**	**F1**
Normal display	[9]	L	L
Flashing of the display (only units with LED display)	[10]	X	H
Reduction of the brightness (only units with LED display)	[11]	H	X

L = L-Signal, H = H-Signal, X = L- or H-Signal

With L signal on the inputs F2 and F1 the display is static and in normal brightness [9]. With an H-signal at the input F1, the display flashes [10]. With an H-signal at the input F2, the brightness of the display is reduced [11].

For units with LRD® display flashing and reducing of the brightness are not possible.

Debouncing time

The signal inputs D6...D1 and the functional 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.

Data backup

In case of failure of the operating voltage the display value and the circuit state of the contacts are saved. Once the operating voltage is restored the stored value appears in the display and the contacts switch into the saved status.

If in menu item F a display test has been preselected it will run beforehand.

Serial Interface

The units have a galvanically isolated RS422 serial interface. It transmits the current display value as ASCII data telegram with final <CR/LF> (xxxxxx<CR><LF>) >) in intervals of approx. 0.5 sec. 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 leading zeros is not taken into account.

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

$S<CR/LF>	Start timer
$H<CR/LF>	Interrupt time counting
$C<CR/LF>	Continue time counting
$G<CR/LF>	Read out display value (format see above)
$R<WERT><CR/LF>	Set start/stop value* (-99999…000000…999999)
$1<WERT><CR/LF>	Switching point 1* (-99999…000000…999999)
$2<WERT><CR/LF>	Switching point 2* (-99999…000000…999999)
$Q1<CR/LF>	Acknowledge switching output 1 (switch to idle position)
$Q2<CR/LF>	Acknowledge switching output 2 (switch to idle position)
$L<WERT><CR/LF>	LED color beneath the two switching points (0, 1, 2)**
$M<WERT><CR/LF>	LED color between the switching points (0, 1, 2)**
$U<WERT><CR/LF>	LED color above the two switching points (0, 1, 2)**

* Observe the input format for these commands.
** 0 = red, 1 = orange, 2 = green

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

Example:
If switching point 2 is to be set to -20, the command is: **$L-20<CR>**.
If the LED color is to be set to red above the two switching points the command is: **$U0<CR>**.

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

6 Parametrization

Menu

The parameterization of the devices is carried out in a menu 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	Display format	Seconds decimal (000000…999999)*		1 SSSS
		Minutes decimal (000000…999999)		1 MMMM
		Hours decimal (000000…999999)		1 HHHH
		Days decimal (000000…999999)		1 dddd
		Minutes (0000…9999), Seconds (0...59)		1 MMSS
		Hours decimal (0000...9999), Minutes (0...59)		1 HHMM
		Days decimal (0000...9999), Hours (...23)		1 ddHH
		Hours decimal (00...99), Min. (0...59), Sec. (00…59)		1 HMS
		Days decimal. (00...99), Hours (0...23), Minutes (00…99)		1 dhM
2	Counting direction	Count downwards to zero starting from the start value*		2 dEc
		Count upwards to the stop value starting from zero		2 Inc
3	Start value (Dec) [1]	-99999…000000…999999		3 LoAd↔000000
	Stop value (Inc) [1]	-99999…000000…999999		3 StoP↔000000
4	Switching point 1 [1]	-99999…000000…999999		4 rEL 1↔000000
5	Switching point 2 [1]	-99999…000000…999999		5 rEL2↔000000
6	Idle position of the contacts	Contact 2 open *	Contact 1 open *	6 nono
		Contact 2 open	Contact 1 close	6 nonc
		Contact 2 close	Contact 1 open	6 ncno
		Kontakt 2 close	Contact 1 close	6 ncnc
7	Wiping function switching output 1	No wiping pulse*		7 OFF
		Wiping pulse 1 sec		7 1
		Wiping pulse 2 sec		7 2
		Wiping pulse 4 sec		7 4
8	Wiping function switching output 2	No wiping pulse*		8 OFF
		Wiping pulse 1 sec		8 1
		Wiping pulse 2 sec		8 2
		Wiping pulse 4 sec		8 4
9	Reaching zero or stop value	Timer stops*		9 StoP
		Timer restarts from zero or start-value		9 Auto
		Timer continues to count		9 Cont
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 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	Leading zeros not displayed*	F ----
		Leading zeros displayed	F 8888
		Demo operation mode	F PLAY
U	Save	Saving parameters* (Set)	U SEt
		Not saving parameters (Escape)	U ESC
		Restore to factory settings (Default)	U dEF

[1] The setting range depends on the display range of the unit (see following table):

Display range	Unit version	Setting range	Factory setting Start/Stop value
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

Display format

The display format is set in the menu item 1:

Setting SSSS Seconds decimal (000000…999999)

Setting MMMM Minutes decimal (000000…999999)

Setting HHHH Hours decimal (000000…999999)

Setting dddd Days decimal (000000…999999)

Setting MM.SS Digits C6…C3 = Minutes decimal (0000…9999)
Digits C2…C1 = Seconds (00…59)
Decimal point at position C3 (only units with LED display)

Setting dd.HH Digits C6…C3 = Days decimal (0000…9999)
Digits C2…C1 = Hours (00…23)
Decimal point at position C3 (only units with LED display)

Setting H.MS Digits C6…C5 = Hours (00…23)
Digits C4…C3 = Minutes (00…59)
Digits C2…C1 = Seconds (00…59)
Decimal point at position C3 and C5 (only units with LED display)

Setting d.HM Digits C6…C5 = Days decimal (00…99)
Digits C4…C3 = Hours (00…23)
Digits C2…C1 = Minutes (00…59)
Decimal point at position C3 and C5 (only units with LED display)

Setting d.HMS Digits C8…C7 = Days decimal (00…99)
Digits C6…C5 = Hours (00…23)
Digits C4…C3 = Minutes (00…59)
Digits C2…C1 = Seconds (00…59)
Decimal point at position C3, C5 and C7 (only devices with LED display)

For all display formats the decimal point flashes once per second at the position C1 (only units with LED display).

The numbers are shown in full days, minutes and hours. The values are not rounded but the switching outputs work to the second.

Counting direction

The counting direction is set in menu item 2. When dEc is set, the time is counted downwards starting from a programmed start value and when Inc is set, the time is counted upwards starting from zero.

Start/stop value

The start value (for counting downwards) and the stop value (for counting upwards) are set in the menu item 3.

In menu item 3, LoAd (start value) or StoP (stop value) and the actual setting alternately appear in the menu display. At the same time 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.

Switching outputs

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

The switching point of the output 1 is set in menu item 4 and the switching point of the output 2 is set in menu item 5 rEL 1 resp. rEL2 and the actual setting alternatively appears in the monitor display. Besides that 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.

The contacts of the switching outputs switch in their working position as soon as the displayed value corresponds exact to the second with the switching point which is set in the menu.

Input format menu items 3...5

The entries in the menu items 3, 4 and 5 are interpreted according to the display format selected in the menu item 1. This is also valid for the entries via external coding switches (see Chapter 7) and commands via the serial interface

If, for example, the setting.HMS.is selected in the menu item 1, the entry of 123456 has the following signification: 12 hours, 34 minutes, 56 seconds.

Attention: It is therefore not permitted to enter unrealistic values, for example 90 for the seconds, because they may lead to an unforeseeable behavior of the display.

Idle and work position of the contacts

In menu item 6 you can set whether the contacts of the switching outputs in their idle position are open (no) or closed (nc). The work position is always the vice versa circuit state.

Wiping function

A wiping function of the switching outputs can be set in the menu items 7 and 8.

If OFF is set, the wiping function is deactivated. The contact of the corresponding switching output changes permanently to its work position. The contacts can be switched in their idle position (see Chapter 5) via the signal inputs D5 (switching output 1) and D6 (switching output 2).

If 1, 2 or 4 is set the wiping function is activated. The contact of the corresponding switching output changes to its work position and then, after 1, 2 or 4 seconds, back to its idle position (wiping function).

The wiping function is suitable, for example, for activating optical or acoustical signal transmitters.

Reaching the zero or stop value

In the menu item 9, the behavior of the timer when reaching zero (counting downwards) or when reaching the stop value (counting upwards) can be set:

Setting StoP	Timer stops.
Setting Auto	Timer restarts. The two switching outputs change to the respective idle position.
Setting Cont	Timer continues to count (when counting downwards into the negative range).

LED color

In menu item L1, L2 and L3 you can set the LED color. The switching of the LED color takes place automatically on the switching points of the switching outputs (only for units with switchable LED color).

Leading zero suppression

In menu item C you can 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 activate the unit.

7 External coding switches

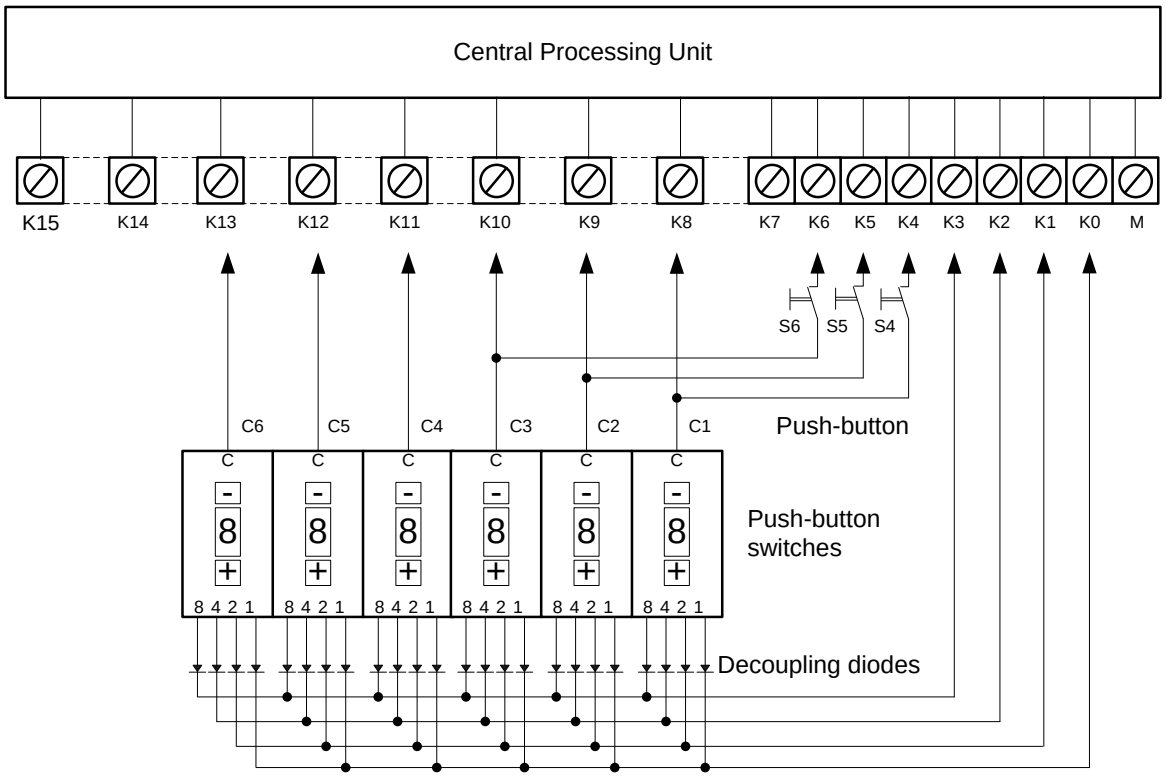
Application

As described in chapter 5, the timer has a start or stop value depending on the selected display format. This value and the switching points of the switching outputs are set in the menu while the unit is open (see Chapter 6).

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-U1. 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).

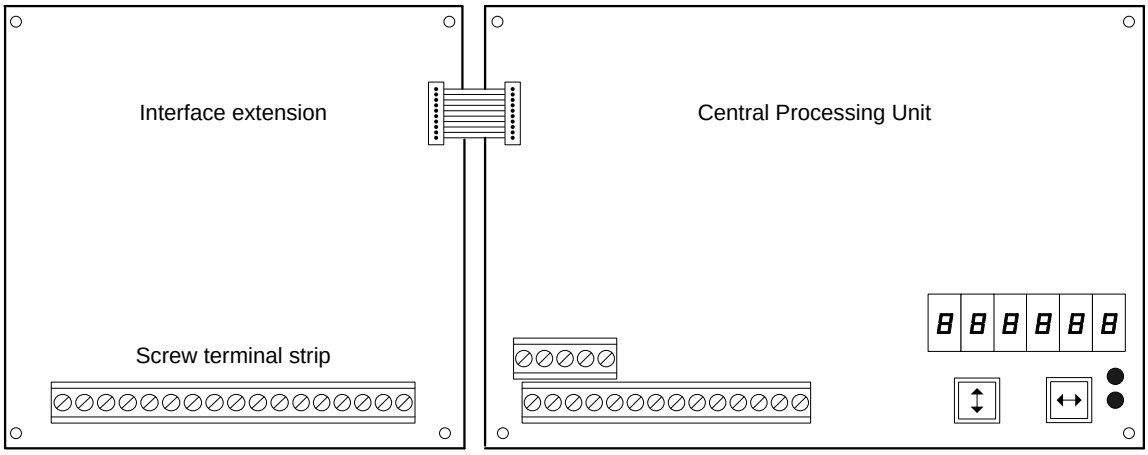
Circuit layout



The terminals K15, K14 and K7 must not be used.

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 the start/stop value

By closing the button S4, the start value (for counting downwards) resp. the stop value (for counting upwards) is set to the value that is set on the coding switches. The setting in menu item 3 is then overwritten. At the same time, the timer is started and both switching outputs change to their idle position.

To start the timer with a control signal (p. e. PLC) the signal input D1 of the control computer has 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 4 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 5 is then overwritten.

8 Technical data

Unit properties

The model designation is structured as follows:

S302 – ☐☐ / ☐☐ / ☐☐ – ☐☐☐ / ☐☐ – ☐☐

No dimension symbol	0
Dimension symbol	F

2 Digits	2
3 Digits	3
↓	↓
6 Digits	6

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	U	0
Devices with interface extension for external coding switches	U	1

Max. power consumption

Units with one-sided display		Units with double-sided display	
2 digits		2 digits	
S302-x2/06/0x-1xx/xx-xx	ca. 12 VA	S302-x2/06/0x-2xx/xx-xx	ca. 15 VA
S302-x2/10/0x-1xx/xx-xx	ca. 15 VA	S302-x2/10/0x-2xx/xx-xx	ca. 21 VA
S302-x2/10/4x-1xx/xx-xx	ca. 50 VA	S302-x2/10/4x-2xx/xx-xx	ca. 91 VA
S302-x2/16/0x-1xx/xx-xx	ca. 37 VA	S302-x2/16/0x-2xx/xx-xx	ca. 66 VA
S302-x2/16/4x-1xx/xx-xx	ca. 50 VA	S302-x2/16/4x-2xx/xx-xx	ca. 91 VA
S302-x2/25/0x-1xx/xx-xx	ca. 46 VA	S302-x2/25/0x-2xx/xx-xx	ca. 83 VA
S302-x2/25/4x-1xx/xx-xx	ca. 85 VA	S302-x2/25/4x-2xx/xx-xx	ca. 164 VA
3 digits		3 digits	
S302-x3/06/0x-1xx/xx-xx	ca. 13 VA	S302-x3/06/0x-2xx/xx-xx	ca. 17 VA
S302-x3/10/0x-1xx/xx-xx	ca. 17 VA	S302-x3/10/0x-2xx/xx-xx	ca. 26 VA
S302-x3/10/4x-1xx/xx-xx	ca. 50 VA	S302-x3/10/4x-2xx/xx-xx	ca. 91 VA
S302-x3/16/0x-1xx/xx-xx	ca. 51 VA	S302-x3/16/0x-2xx/xx-xx	ca. 92 VA
S302-x3/16/4x-1xx/xx-xx	ca. 50 VA	S302-x3/16/4x-2xx/xx-xx	ca. 91 VA
S302-x3/25/0x-1xx/xx-xx	ca. 63 VA	S302-x3/25/0x-2xx/xx-xx	ca. 116 VA
S302-x3/25/4x-1xx/xx-xx	ca. 85 VA	S302-x3/25/4x-2xx/xx-xx	ca. 164 VA
4 digits		4 digits	
S302-x4/06/0x-1xx/xx-xx	ca. 14 VA	S302-x4/06/0x-2xx/xx-xx	ca. 19 VA
S302-x4/10/0x-1xx/xx-xx	ca. 21 VA	S302-x4/10/0x-2xx/xx-xx	ca. 33 VA
S302-x4/10/4x-1xx/xx-xx	ca. 50 VA	S302-x4/10/4x-2xx/xx-xx	ca. 91 VA
S302-x4/16/0x-1xx/xx-xx	ca. 64 VA	S302-x4/16/0x-2xx/xx-xx	ca. 119 VA
S302-x4/16/4x-1xx/xx-xx	ca. 50 VA	S302-x4/16/4x-2xx/xx-xx	ca. 91 VA
S302-x4/25/0x-1xx/xx-xx	ca. 79 VA	S302-x4/25/0x-2xx/xx-xx	ca. 150 VA
S302-x4/25/4x-1xx/xx-xx	ca. 85 VA	S302-x4/25/4x-2xx/xx-xx	ca. 164 VA
5 digits		5 digits	
S302-x5/06/0x-1xx/xx-xx	ca. 15 VA	S302-x5/06/0x-2xx/xx-xx	ca. 21 VA
S302-x5/10/0x-1xx/xx-xx	ca. 23 VA	S302-x5/10/0x-2xx/xx-xx	ca. 38 VA
S302-x5/10/4x-1xx/xx-xx	ca. 50 VA	S302-x5/10/4x-2xx/xx-xx	ca. 91 VA
S302-x5/16/0x-1xx/xx-xx	ca. 77 VA	S302-x5/16/0x-2xx/xx-xx	ca. 146 VA
S302-x5/16/4x-1xx/xx-xx	ca. 50 VA	S302-x5/16/4x-2xx/xx-xx	ca. 91 VA
S302-x5/25/0x-1xx/xx-xx	ca. 96 VA	S302-x5/25/0x-2xx/xx-xx	ca. 184 VA
S302-x5/25/4x-1xx/xx-xx	ca. 85 VA	S302-x5/25/4x-2xx/xx-xx	ca. 164 VA
6 digits		6 digits	
S302-x6/06/0x-1xx/xx-xx	ca. 16 VA	S302-x6/06/0x-2xx/xx-xx	ca. 23 VA
S302-x6/10/0x-1xx/xx-xx	ca. 26 VA	S302-x6/10/0x-2xx/xx-xx	ca. 43 VA
S302-x6/10/4x-1xx/xx-xx	ca. 50 VA	S302-x6/10/4x-2xx/xx-xx	ca. 91 VA
S302-x6/16/0x-1xx/xx-xx	ca. 91 VA	S302-x6/16/0x-2xx/xx-xx	ca. 173 VA
S302-x6/16/4x-1xx/xx-xx	ca. 50 VA	S302-x6/16/4x-2xx/xx-xx	ca. 91 VA
S302-x6/25/0x-1xx/xx-xx	ca. 113 VA	S302-x6/25/0x-2xx/xx-xx	ca. 217 VA
S302-x6/25/4x-1xx/xx-xx	ca. 85 VA	S302-x6/25/4x-2xx/xx-xx	ca. 164 VA

The power consumption for the unit version model S302-xx/xx/0x-xxx/xx-xx is also valid for the unit version 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 mm²
Power supply	Capacity of terminals 0,2…4 mm²

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

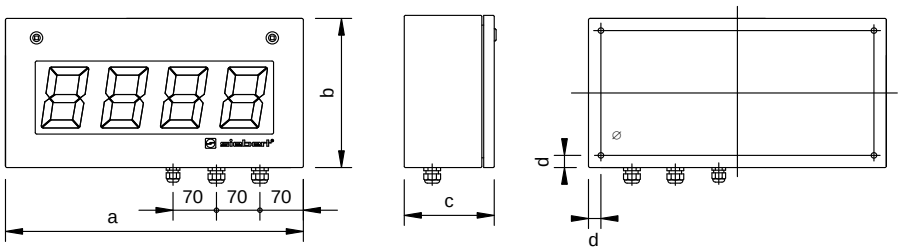
Ambient conditions

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

Measurements and weights

Units with one-side display

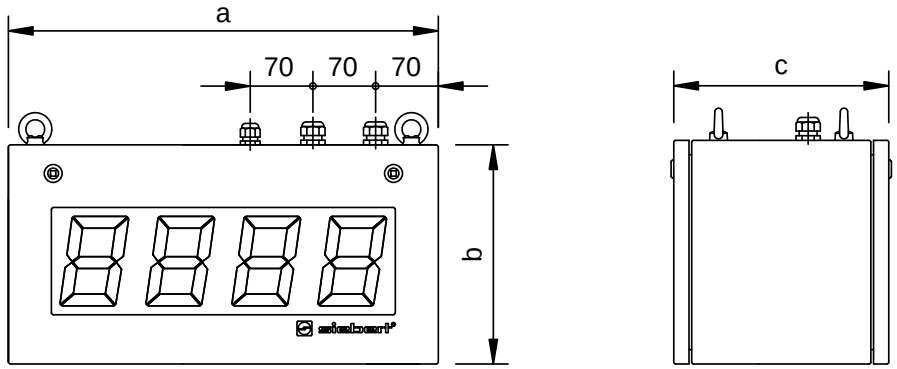
The following figure shows unit version S302-04/10/4x-1xx/xx-xx, representing the other unit versions listed in the following table.



2 digits	a	b	c	d	ø	Weight
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

Units with double-sided display

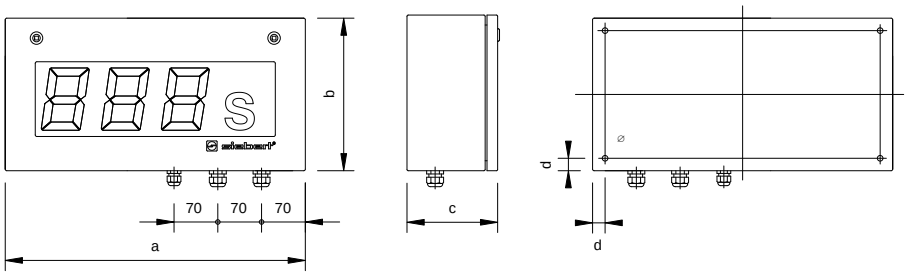
The following figure shows unit version S302-04/10/4x-2xx/xx-xx, representing the other unit versions listed in the following table.



2 digits	a	b	c	Weight
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

Units with one-side display and dimension symbol

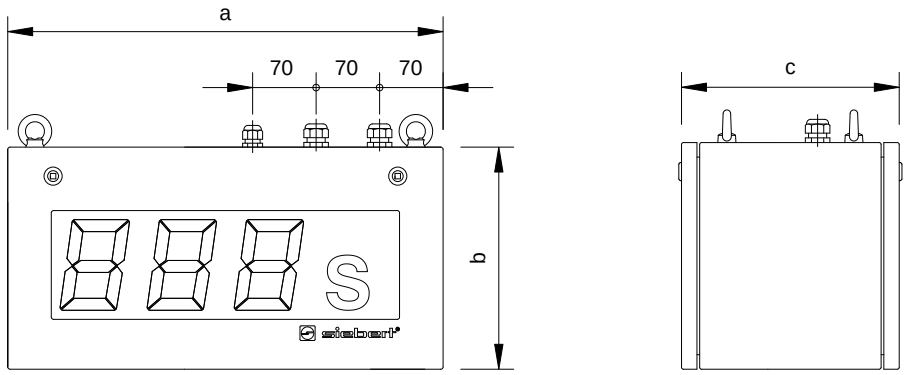
The following figure shows unit version S302-F3/10/4x-1xx/xx-xx, representing the other unit versions listed in the following table.



2 digits + dimension	a	b	c	d	ø	Weight
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

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.

2 digits + dimension	a	b	c	Weight
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