

BA60

Customer Display

Operating Manual



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Manufacturers Declaration and Approval



The device complies with the requirements of the EEC directive 89/336/EEC with regard to "Electromagnetic compatibility" and 73/23/ECC "Low Voltage Directive".

Therefore, you will find the CE mark on the device or packaging.

FCC-Class A Declaration

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not in-stalled and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Modifications not authorized by the manufacturer may void users authority to operate this device.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NBM-003 du Canada.



Device repairs must be carried out by authorized personnel. All guarantee and liability claim are automatically excluded if repairs have been carried out by unauthorized personnel.

Notes on Care

Wipe the customer display with a damp cloth as required. Solvents must not be used under any circumstances as they may damage the plastic.

Warranty

Wincor Nixdorf guarantees a limited warranty engagement for 12 months beginning with the date of delivery. This warranty engagement covers all those damages which occur despite a normal use of the product.

Damage because of

- Improper or insufficient maintenance,
- Improper use of the product or unauthorized modification of the product,
- Inadequate location or surroundings

will not be covered by the warranty.

Recycling the BA60



Environmental protection does not begin when time comes to dispose of the BA60; it begins with the manufacturer. This product was designed according to our internal norm "Environmental conscious product design and development"

The BA60 is manufactured without the use of CFCs and CCHS and is produced mainly from reusable components and materials.

The processed plastics can, for the most part, be recycled. Even the precious metals can be recovered, thus saving energy and costly raw materials.

Please do not stick labels onto plastic case parts. This would help us to re-use components and material.

At this time, there are still some parts that are not reusable. Wincor Nixdorf guarantees the environmentally safe disposal of these parts in a Recycling Center, which is certified pursuant to ISO 9001.

So don't simply throw your BA60 on the scrap heap when it has served its time, but take advantage of the environmentally smart, up-to-date recycling methods!

Please contact your competent branch office for information on how to return and re-use devices and disposable materials.

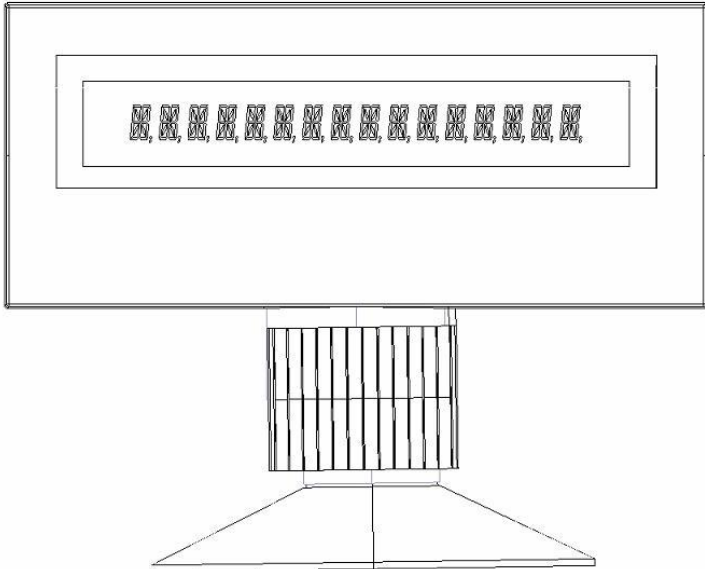
Introduction

The BA60 customer display is mainly used in POS installations which are designed in modular form. It is either securely screwed behind the POS system or installed near it so that it is ideally positioned in the customer's field of vision.

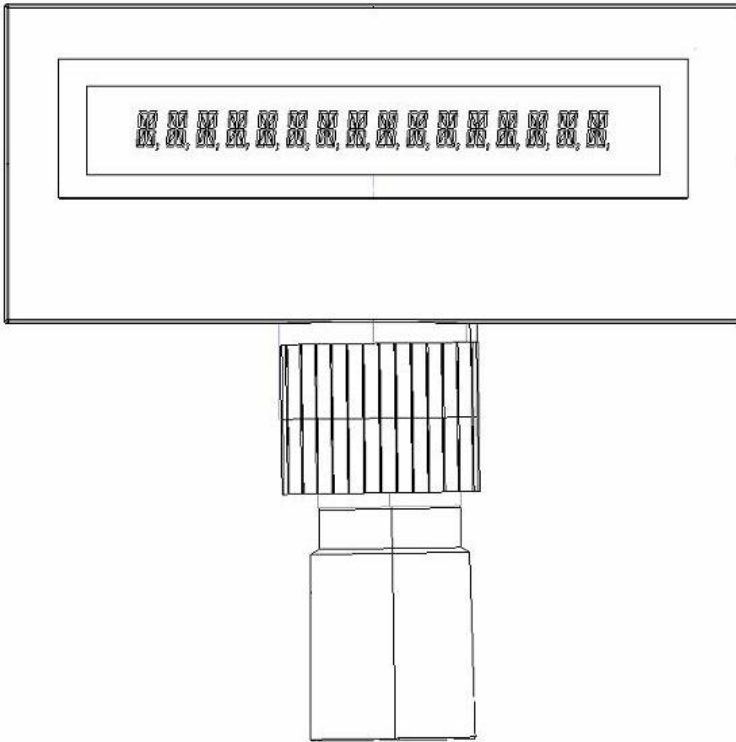
The display is a vacuum florescent display (VFD) with one line, 16 alphanumeric characters. The standard character set is implemented. Implementation of VFD technology ensures that the customer display is ergonomically designed to achieve a high degree of readability, irrespective of the cashier's angle of vision.

The display is connected to the point of sale system via a RS232C interface. The voltage (12 V DC) is also supplied via this interface.

The following two types BA60 customer displays are available to meet individual installation requirements:



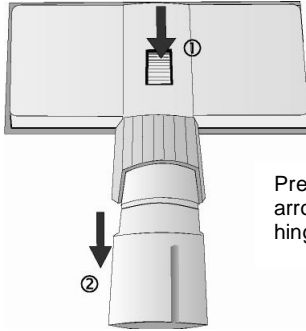
BA60 customer display with base/rotating table



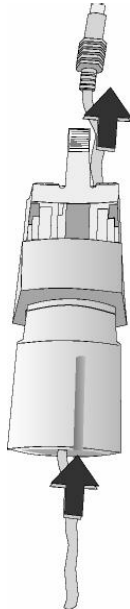
BA60 customer display with adaptor for tube-based installation

Installation of the Connector

Tube-based

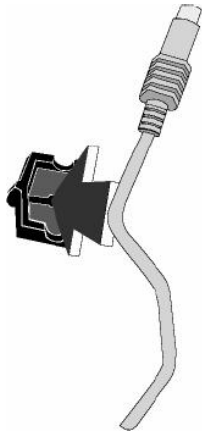


Press the release knob marked with the arrow in the drawing (1) and disconnect the hinge from the customer display (2).

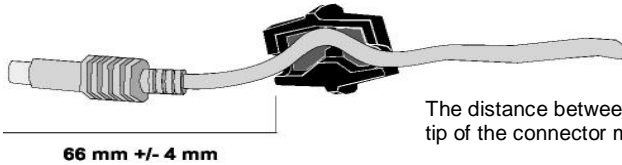


Thread the cable through the adapter and then through the hinge.

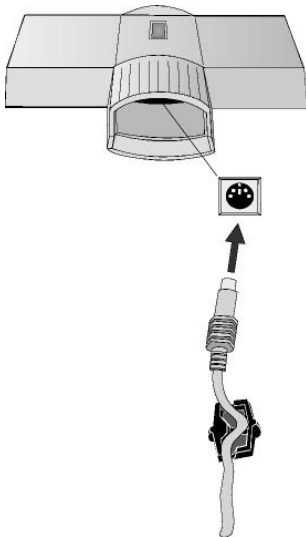
Connect the hinge and adapter.



Secure the connector cable in the strain relief.

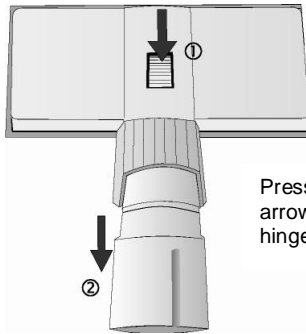


The distance between the strain relief and the tip of the connector must be 66mm (± 4 mm)

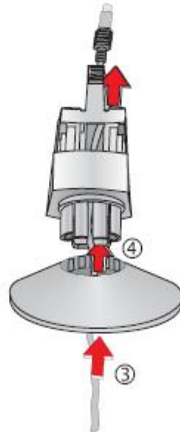


Plug the cable connector into the appropriate socket of the customer display and plug the adapter/hinge into the customer display again until it locks into place.

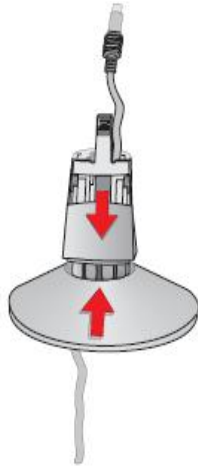
Base / Rotating Plate



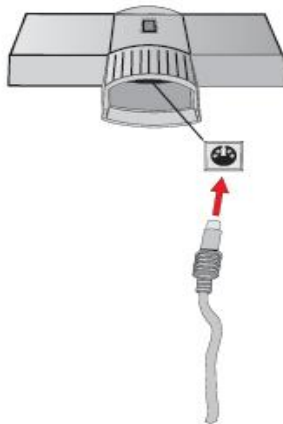
Press the release knob marked with the arrow in the drawing (1) and disconnect the hinge from the customer display (2).



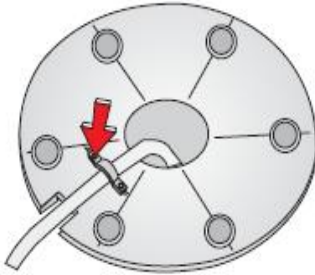
Thread the cable through the base (3) and then through the hinge (4)



Connect the base and the hinge.



Plug the cable connector into the appropriate socket of the customer display and plug the base/hinge into the customer display again until it locks into place.



A metal bracket of the strain relief is situated on the bottom side of the base table. Loosen one of the screws (see arrow), push the bracket aside and guide the connector cable from inward to outward under the bracket through the recess. Tighten the screw.

Customer Display Control

The customer display is controlled via software. The commands are entered with the appropriate ESC sequences. The following functions are available:

- The cursor can be moved to the desired position;
- The customer display can be deleted;
- The characters from the cursor to the end of the line can be deleted;
- An identification code can be requested;
- A self-test can be performed.

Control Sequences

The customer display operates in VT100 mode, i.e. it emulates a subset of the VT100 ESC sequences and control bytes. These are illustrated in the following:

Backspace (without deleting)	BS
Carriage return	CR
Delete display	ESC[2J
Position cursor	ESC[Py;PxH
Delete to end of line	ESC[0K
Call display identification	ESC[0c

Backspace (without deleting)

The **BS** command (hexadecimal 08) moves the cursor one space to the left. If there is a character in the position to which the cursor moves, it is not deleted. This command is ignored if the cursor is already at the first position of the line.

Carriage return

The cursor is moved to the beginning of the line in which it is currently positioned when the **CR** command (hexadecimal 0D) is entered. The command is ignored if the cursor is already at the beginning of the line.

Delete display

The display can be deleted with this ESC sequence. The cursor position remains unchanged. The ESC sequence is as follows:

Code	Hexadecimal
ESC'[2'J'	1B 5B 32 4A

Position cursor

The cursor position can be defined with this ESC sequence. The cursor is not visible on the display whilst this is being carried out. The following ESC sequence (for example) can be implemented:

Code	Hexadecimal
ESC'[Py';Px'H'	1B 5B 31 3B 31 48

The parameters are transferred as ASCII characters and have the following meaning:

Parameter	Meaning
Py	This parameter defines the line.
Px	This parameter defines the column.

Example

The parameters are to be replaced with the following values if you wish to position the cursor at the very beginning of the first line:

ESC'[1';1'H'

If you select 0 for the parameter value, this is interpreted as 1 by the display. If, on the other hand, you select a value which is greater than the maximum line and column value, the display will interpret this value as the maximum value permissible.

The cursor is positioned in the first column of the first line if no parameter values are entered.

Delete to end of the line

This command deletes the characters from the cursor, cursor position is included, to the end of the line. The position of the cursor remains unchanged.

The ESC sequence is as follows:

Code	Hexadecimal
ESC['0"K'	1B 5B 30 4B

Call display identification

The identification is called with the following ESC sequence:

Code	Hexadecimal
ESC['c'	1B 5B 63

The following is displayed on the screen when the sequence is entered:

ESC[?Pn1;Pn2;Pn3;Pn4;Pn5c

Pn1	Type of display	= 2	=	VFD display
Pn2	PROM version	= currently 01		(depends on approved PROM version)
Pn3	Character set	= 0	=	standard character set
Pn4	Number of line	= 1		
Pn5	Column/line	= 16		

i.e. ESC[?2;01;0;1;16c is transmitted.

Character Sets

All the characters are output from the defined character set at the current cursor position. The cursor is moved one column to the right. The characters are displayed but the cursor position remains unchanged if it is already positioned at the right end of the line when the characters are output.

All the undefined characters that are not included in the defined character set and the ESC sequence that have not been defined for the device will be ignored by the system. A blank will be displayed when data corruption occurs.

The character set supported is displayed in the following page.

Upper Lower		0010	0011	0100	0101	0110	0111
		2	3	4	5	6	7
0000	0						
0001	1						
0010	2						
0011	3						
0100	4						
0101	5						
0110	6						
0111	7						
1000	8						
1001	9						
1010	A						
1011	B						
1100	C						
1101	D						
1110	E						
1111	F						

System Connection

The system is connected via the RS232C (V.24) interface with a voltage supply of +12V DC.

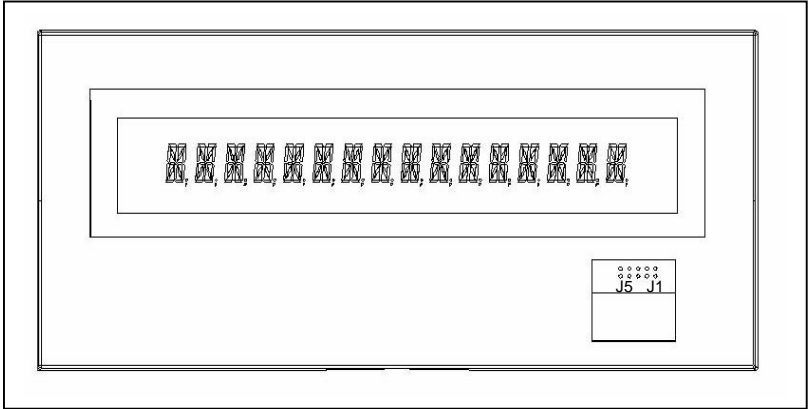
The following parameters are set as standard:

Transmission rate	9,600 Baud
Parity	on
Parity	odd

Parameters other than these standard values can also be selected. Wire jumpers must be soldered onto the display circuitry in order to do so.

Wire jumper	In/Out	Parameter
JP1-JP2	OUT-OUT	9,600 Baud
	IN-OUT	4,800 Baud
JP1-JP2	OUT-IN	2,400 Baud
	IN-IN	1,200 Baud
JP3	OUT	Parity on
	IN	Parity off
JP4	OUT	Parity odd
	IN	Parity even
JP5	OUT	Normal operation
	IN	Self-Test

The position of the wire jumpers on the display circuitry is illustrated in the following diagram. The front plate can be removed by pressing both of the exterior housing clips underneath the plate. The wire jumpers are then accessible.



BA60 Customer display jumper selection

Cable Connection

The customer display cable features a 6-pins female connector at one end (which is connected to the customer display) and a 9-pin D sub connector at the other (which is connected to the COM interface of the point of sale system). Similarly, the voltage (12V) is also supplied to the display via the COM interface.

The pins of the 6-pin mini DIN socket and the 9-pin D sub socket are assigned as follows:

6-pin socket (PCB)	Signal	9-pin D sub socket
1	RTS	7
2	CTS	8
3	TXD	5
4	RXD	2
5	GnD	3
6	12 V	1
		4
		9
		6

Test Functions

The internal RAM of the processor and the EPROM are tested during the start-up phase. All display elements light up for approx. 0.5 seconds if no errors are detected during the test. The display remains blank if an error is isolated.

Starting the test by entering a code

The identification is called with the following ESC sequence:

```
ESC [0c
```

The display runs through the self-test program once when the code is transmitted to the display. Code:

```
ESC[?2;01;0;1;16c
```

The current version number (00-99) is to be entered in place of nn.

The test software performs the following functions:

- The microprocessor and the RAM within the processor are tested. Errors detected are displayed.
- Formation and comparison of the PROM checksum. Errors detected are displayed.
- The display type and version number of the microprogram are displayed.
- The parameters of the serial interface are displayed. The baud rate and the parity parameters are output.
- Display is tested by generating a rough chess board pattern.
- Display is tested by generating a detailed chess board pattern.

Technical Data

The technical data of the Ba60 customer display is detailed in the following table:

Display technology	Vacuum Fluoreszenz Display (VFD)
Character display	1 lines with 16 alphanumeric characters (16 segmented display with dot & comma) Height: 10.0 mm Width: 5.0 mm Color: Green
Self-test function	Possible via software control using ESC sequences and JP5 wire jumper
Interface	RS232C, asynchronous full duplex operation
Transmission modes	standard 9600 bit/sec; parity: on ; parity: odd, even/uneven parity optional with 9.6/4,8 kbit/sec- adjustable via jumper
Voltage supply	12V +/- 10 % with max. 200 mA peak current : 400 mA
System connection	RS232C (V.24) with 12 V DC power supply
Dimension	Height (with base): 165 mm Width: 206 mm Depth: 46 mm
Weight	0.5 kg

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