
10. OPTIONS

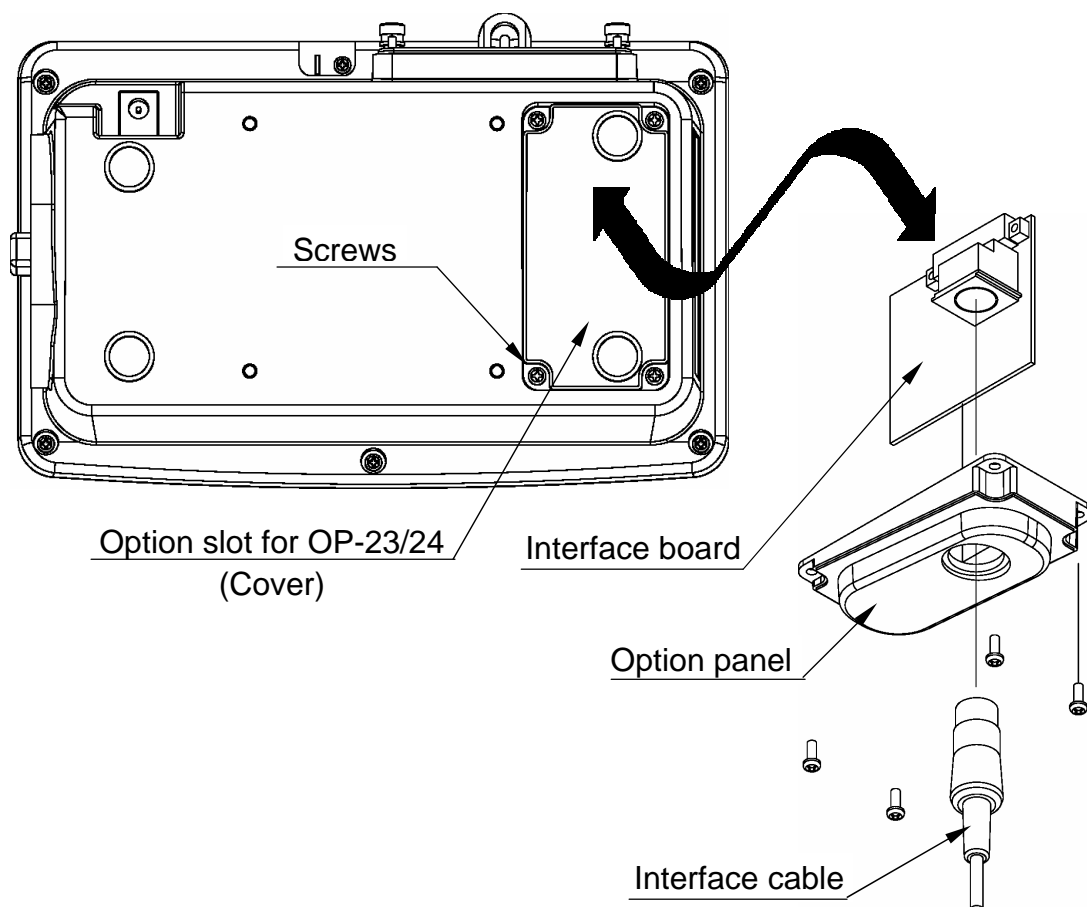
The following options are available for the FG series:

- ✂ OP-23 (FG-23) RS-232C serial interface
- ✂ OP-24 (FG-24) RS-232C serial interface and Comparator relay output
- ✂ **OP-23 and OP-24 cannot be used together.**

10-1. Installation of OP-23/OP-24

The OP-23/OP-24 has an interface board, an option panel and a DIN 8 pin connector. The option panel and DIN connector are common to both options. Before installation, prepare an interface cable using attached DIN connector. Or there is a way to use the optional RS-232C cable (see "10-2. OP-23 RS-232C serial interface").

1. Disconnect the AC adapter from the scale.
2. Remove the four screws and the cover of option slot.
3. Thread the interface cable through the hole of option panel first, and connect the DIN connector to the interface board.
4. Connect the interface board to the connector in the display pod.
5. Attach and fix the option panel using the screws that removed in the step 2.



10-2. OP-23 RS-232C serial interface

This interface allows FG series to be connected with a multi-function printer or a personal computer.

✂ The RS-232C interface has the following four modes.

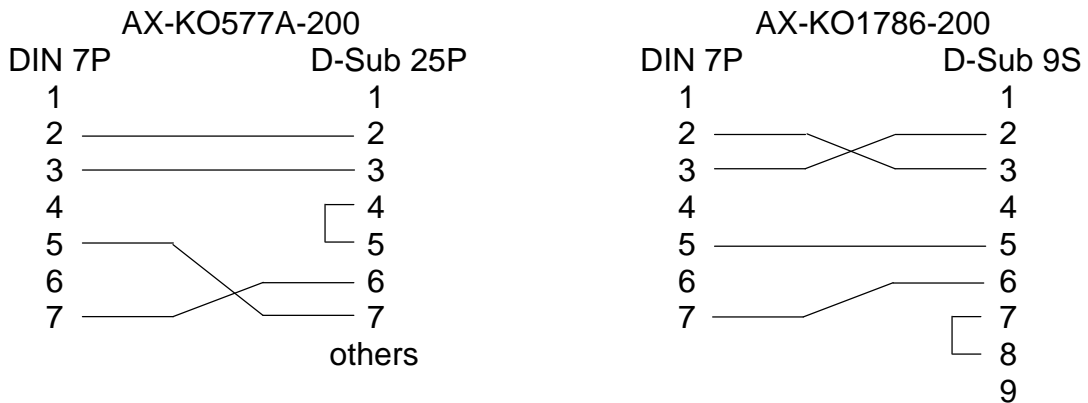
Stream mode	Outputs data continuously.
Command mode	Controls the scale using commands from a computer.
Print switch mode	Outputs data by pressing the PRINT switch..
Auto-print mode	Outputs data which meets the conditions of auto-print.

✂ If necessary, set the parameter of the data format and data output mode (F4, F5 and F8).

✂ A DIN 8 pin connector (JA+TCP0586) is provided with the OP-23 for wiring.

✂ There are optional cables to connect with a personal computer.

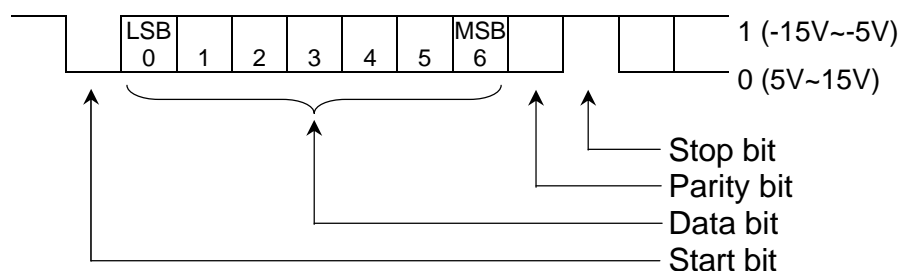
AX-KO577A-200	FG to D-Sub 25 pin computer / RS-232C cable, 2m
AX-KO1786-200	FG to D-Sub 9 pin computer / RS-232C cable, 2m



(DIN 7 pin plug P can connect with DIN 8 pin socket.)

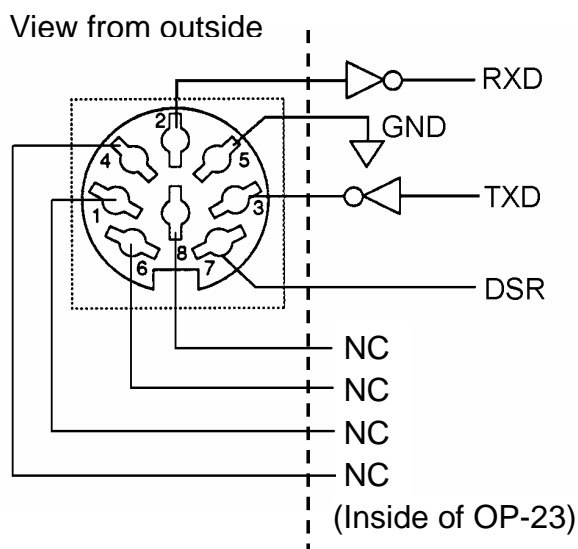
Interface specifications

Transmission system	EIA RS-232C
Transmission form	Asynchronous, bi-directional, half-duplex
Data format	Baud rate: 2400, 4800, 9600 bps
	Data: 7 bits + parity 1bit (even)
	Start bit: 1 bit
	Stop bit: 1 bit
	Code: ASCII
	Terminator: C _R L _F (C _R : 0Dh, L _F : 0Ah)

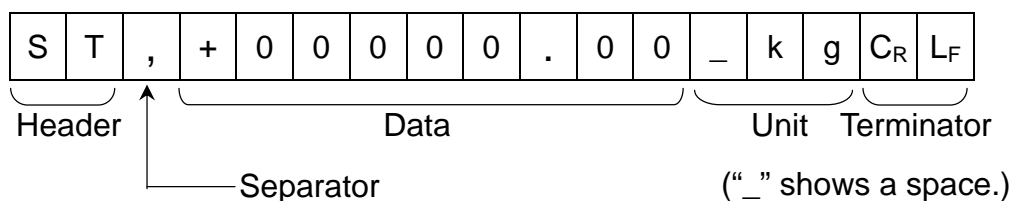


Pin connections

Mating connector:
DIN 8 pin (JA+TCP058)
Attached to FG-23.



Data format



There are 4 types of headers:

ST : Stable weighing data

QT : Stable counting data

US : Unstable weighing data (including counting data)

OL : Out of weighing range (Over)

The data is normally 9 digits including decimal point and a sign.

There are 4 types of units:

_ k g : Weighing data “gram”

_ P C : Counting data “pcs”

_ l b : Weighing data “decimal pound”

_ o z : Weighing data “decimal ounce”

The terminator is always C_RL_F.

Example of output data:

Weighing data “kg”

S	T	,	+	0	0	1	2	3	.	4	5	_	k	g	C _R	L _F
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

Counting data

Q	T	,	+	0	0	0	1	2	3	4	5	_	P	C	C _R	L _F
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

Out of range “kg” (+)

O	L	,	+	9	9	9	9	9	.	9	9	_	k	g	C _R	L _F
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

Out of range “pcs” (-)

O	L	,	-	9	9	9	9	9	9	9	9	_	P	C	C _R	L _F
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------------	----------------

Data output mode

✎ **Stream mode** Function setting “F5-0”

The scale outputs the current display data. The data-update rate is approximately 10 times per second. This rate is the same as the display-update.
The scale does not output data while it is in setting mode.

✎ **Print switch mode** Function setting “F5-2”

When the switch is pressed while the weighing data is stable (STABLE indicator is on), the scale transmits the data.

✎ **Auto-print mode +/- data** Function setting “F5-3”

The scale transmits the weighing data when the display is stable (STABLE indicator is on) and the data is more than +4d or less than -4d of weight data.

d = minimum weight display (see “12-1 Specifications”)

When in counting mode, “d” is equal to minimum weight display of kg mode.

The next output can be obtained after the display returns to between -4d and +4d.

✎ **Auto-print mode + data** Function setting “F5-4”

The scale transmits the weighing data when the display is stable (STABLE indicator is on) and the data is more than +4d of weight data.

d = minimum weight display (see “12-1 Specifications”)

When in counting mode, “d” is equal to minimum weight display of kg mode.

The next output can be obtained after the display returns to below +4d.

✎ **Command mode** Function setting “F5-1”

In the command mode, the scale is controlled by commands that come from the personal computer and so on.

Command list

“Q” command Command to request the current weighing data.

Command

Reply , .

“Z” command Same operation as the or switch.

Command

✎ This command works as for the metric models
and as for U.S.A. models.

“T” command Same operation as the switch.

Command

✎ This command works as for U.S.A. models.

✎ The metric models cannot accept this command.

Reply to the command

When the “F8-0” is selected, the scale reacts to the received command as follows.

- ✎ For the “Q” command, the scale will send the data.
- ✎ For the “Z” and “T” commands, the scale will send the same code as a reply after executing the command.

Reply

Z	C _R	L _F
---	----------------	----------------

Reply

T	C _R	L _F
---	----------------	----------------

When the command cannot execute because the scale is unstable, for example, “I” will be sent.

Reply

I	C _R	L _F
---	----------------	----------------

- ✎ If the received command is not for the FG series, the scale will send “?”. The “T” command for the metric model is included to this group.

Reply

?	C _R	L _F
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- ✎ When “F8-1” is selected, there is no reply except the “Q” command.

10-3. OP-24 RS-232C serial interface and Comparator relay output

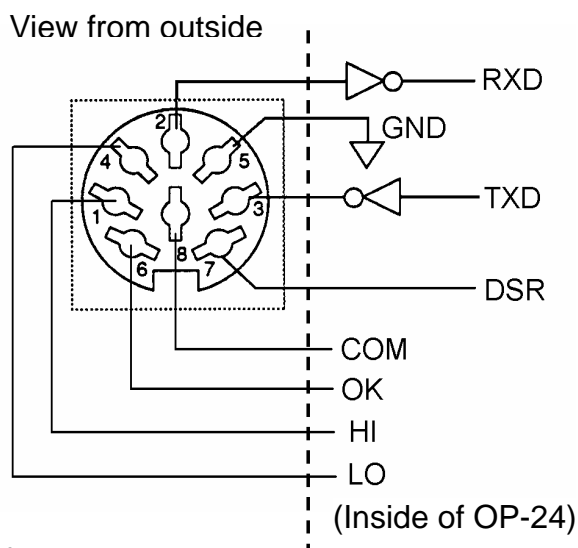
The OP-24 has an RS-232C series interface and relay output for the comparator function. It allows output of the HI, OK or LO signal results to an external device as a solid state relay output.

The specification for the RS-232C interface is same as the OP-23 (FG-23). See “10-2. OP-23 RS-232C serial interface” for further information.

Interface specifications

Pin connections

Mating connector:
DIN 8 pin (JA+TCP058)
Attached to FG-24.



Maximum rating for relay is as follows.

- ✎ Maximum voltage: 50V DC
- ✎ Maximum current: 100mA DC
- ✎ Maximum ON resistance: 35?