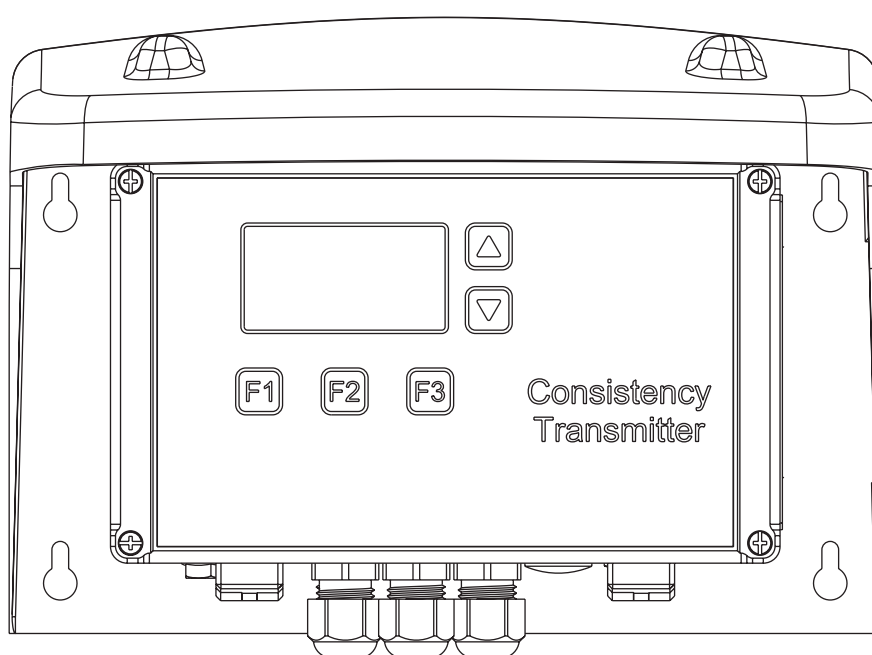


# Pulptec™ JCT-1200

## Junction Box



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## Disclaimer

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# 1 Product Introduction

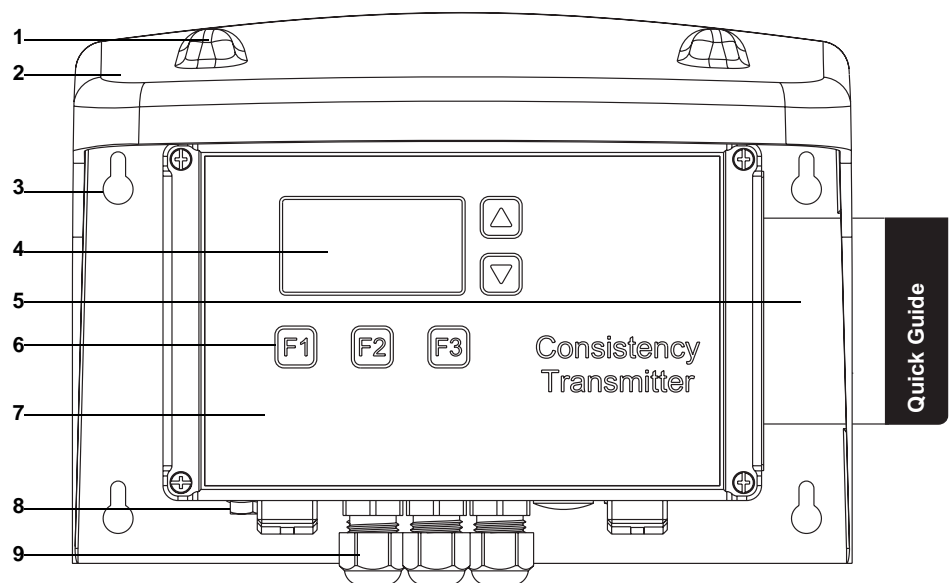
## 1.1 System Description

The JCT-1200 junction box is delivered as a complete unit from BTG, normally in conjunction with a transmitter. It has the following functions:

- Local display and console for basic configuration and operation of the transmitter
- Connection point between the transmitter and the DCS (Distributed Control System)
- Local connection for a hand-held BTG SPC-1000 terminal, for a laptop PC with BTG's SPCwin program, or for a standard HART® terminal
- Fieldbus communication interface (optional)
- Large illuminated display for easy reading
- Provides full setting of the transmitter
- Protected from overflow and sun

**Fig 1 JCT-1200 overview**

- 1 Holder for the SPC-1000 hand-held terminal
- 2 Protective cover
- 3 Attachment lug
- 4 LCD display with backlight
- 5 Quick reference guide
- 6 Function keys
- 7 Front cover
- 8 SPC-1000 connector
- 9 Cable glands



## 1.2 Technical Data

### General


**Manufacturer**

BTG, Säfte, Sweden

**Quality assurance**

In accordance with ISO 9001

**Product safety**

Fulfills all relevant CE-directive requirements, Australian  requirements and ETL requirements.

### Functional Specifications

**Measuring ranges**

Four separate, individually programmable ranges. Externally connectable, using binary-coded optocoupler inputs.

**Analog output**

4-20 mA transferred from the transmitter. Current limited to 21 mA.

Superimposed signal according to standard HART<sup>®</sup> protocol

**Fieldbus**

Profibus PA (optional)

Foundation Fieldbus (optional)

**Analog Input**

0 / 4-20 mA

**Alarm signal**

Optocoupler output

**Sample Input**

Logical switch for use with a manual pulp sampler

**Max. loop resistance**

With HART-filter: 750  $\Omega$

Without HART-filter: 1000  $\Omega$  (Standard setting)

**Min. loop resistance**

250  $\Omega$

**Communication**

RS-485 for communication between the transmitter and the junction box.

Supports usage of the BTG SPC-1000 hand-held terminal.

Supports HART<sup>®</sup> universal commands through local connection with a standard HART<sup>®</sup> terminal.

**User interface**

Illuminated display. Buttons for adjustment of transmitter settings.



## Process Specifications

### Ambient temperature

Max. 45°C (113°F)

Min. 0 °C (32°F)

### Storage Temperature

Min. -20°C (-4°F)

Max. 70°C (158°F)

## Support System Specifications

### Power supply

2-wire/3-wire supply: 24 V DC

4-wire supply (SELV/PELV/NEC class 2 Puls power supply unit): 100-240 V AC,  
50/60 Hz (optional)

## Physical Specifications

### Transmitter connection

Complete cable with transmitter connector included in delivery.

Standard length: 10 m/33 ft. Other lengths on request. Max. 100 m/330 ft.

### Degree of protection

Equivalent to IP65/NEMA 4x

### Materials

Electronics enclosure: Polycarbonate thermo plastic

Cable fittings: Polyamide thermo plastic

### Weight

Electronics enclosure 0.8 kg (1.8 lbs)

### Pollution degree

2

# 1.3 Dimensions and Mounting

Fig 2 Dimensions

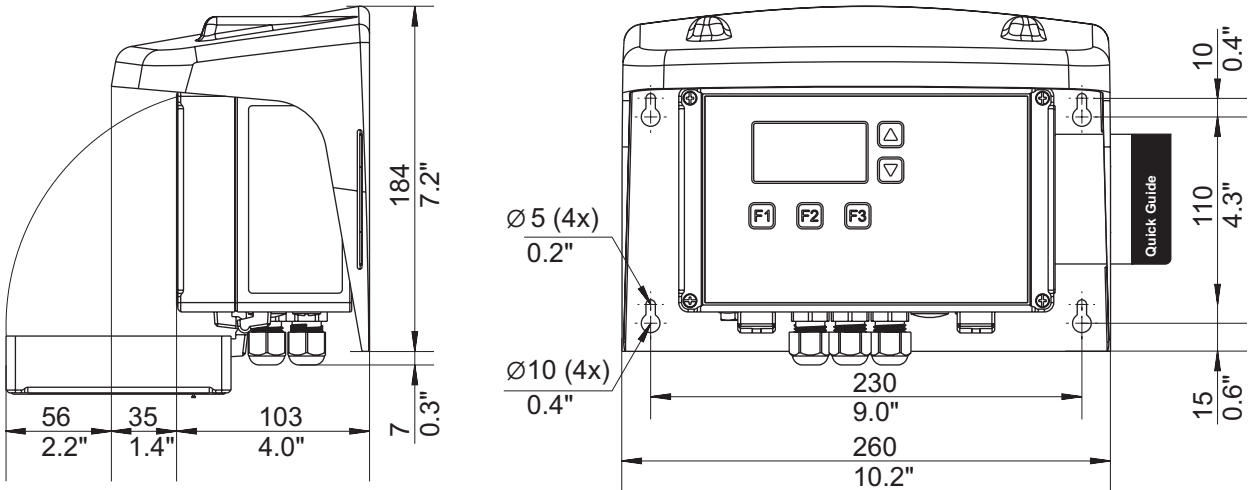


Fig 3 Recommended clearances

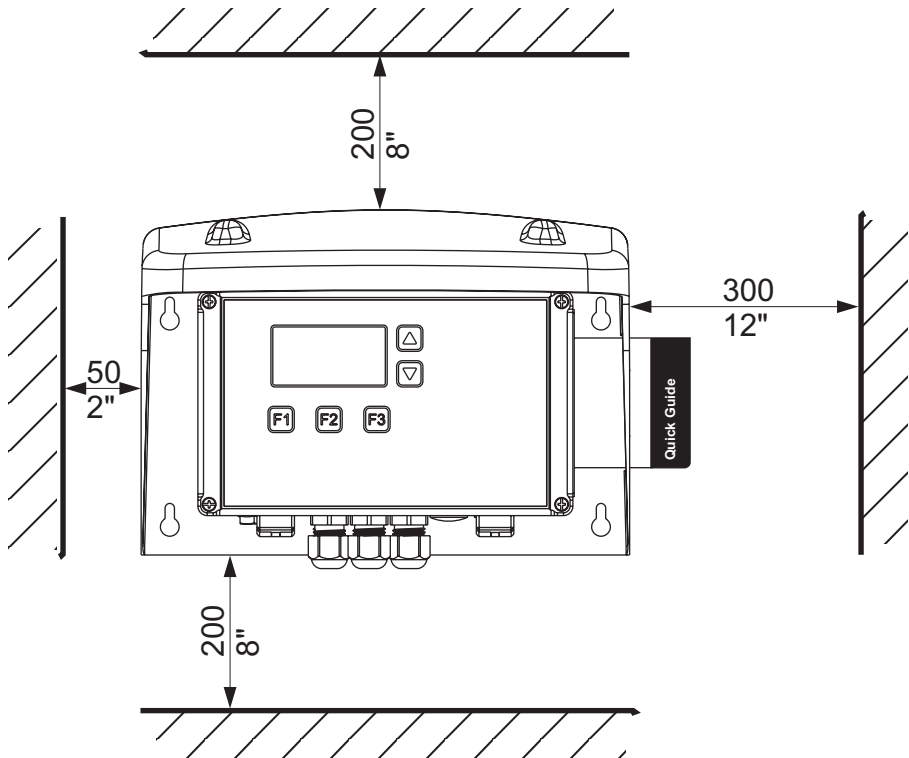
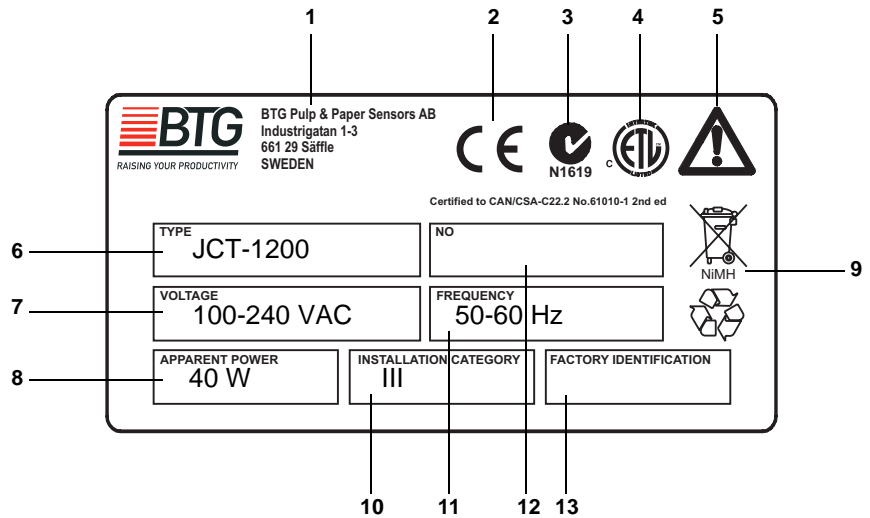


Fig 4 Type sign

## 1.4 Type Sign Explanations



### 1. Manufacturer

### 2. CE-marking

The JCT-1200 is approved according to CE directives.

### 3. C-TIC marking

The JCT-1200 is approved according to Australian C-TIC N1619 directives.

### 4. ETL-marking

The JCT-1200 is approved by ETL

### 5. Warning sign

The JCT-1200 is designed for industrial use. Installation, handling and service must only be carried out by trained and authorized personnel and according to relevant standards. Read the manual for detailed information and pay special attention to the warning signs!

### 6. Type specification

### 7. Voltage

24 V DC without optional power supply unit installed. Automatically adjustable between 100-240 V AC with optional power supply unit installed.

### 8. Apparent power

Max. power consumption 0.5 W without optional power supply unit installed. 40 W continuous output with optional power supply unit installed.

### 9. Recycling marking

The JCT-1200 circuit board is equipped with a NiMH battery, which must be recycled when the unit is discarded.

### 10. Installation category

According to CE-Directive. Fixed installation. Resistant to transients.

### 11. Frequency

The JCT-1200, equipped with an optional power supply unit, operates both at 50 and 60 Hz.

### 12. Manufacturing number

BTG internal product identification number.

### 13. Factory identification



## 2 Safety Instructions

### 2.1 General

These safety regulations are based on a risk analysis carried out in accordance with the requirements of relevant CE directives in order to comply with European standards for CE-marking.

Read these safety regulations before installing the transmitter. Be careful to follow the safety routines when installing, starting up and when carrying out service. Use warning signs for safety information!

All installation, operation, service, and other handling must be carried out by trained and authorized personnel according to applicable regulations.

---

**NOTE!**

Follow this manual for all installation and service procedures.

---

For personal and functional safety: Use only parts which have been manufactured or approved by BTG.

### 2.2 Conventions

The following conventions are used in this manual:

- **DANGER!**

A **DANGER!** admonition is used to emphasize a hazard that could potentially *cause human injury or even death*.

- **WARNING!**

A **WARNING!** admonition is used when there is a risk of *damage* to program, device, machine, sampler and so on.

- **CAUTION!**

A **CAUTION!** admonition is used when there is a risk of *system failure, service interruption, disturbances* to plant operation, a measuring application and so on.

The admonitions above are hierarchic. A **DANGER!** admonition includes the possibility of both a **WARNING!** and a **CAUTION!** admonition.

## 2.3 Safety Regulations



### 2.3.1 Safety Regulations for Installation

All handling of electrical units must take place in accordance with current standards and regulations.



### 2.3.2 Safety Regulations for Service

All handling of electrical units must take place in accordance with current standard and regulations.

## 2.4 CE-Declaration of Conformity

When using the units in combinations other than those tested for, BTG can not guarantee CE directive conformity.

The units in combination with customer-installed external devices may conform with EMC and safety requirements when properly installed and CE-marked equipment is used.

**The system operator is responsible for CE directive conformity.  
Conformity must be verified by inspection..**

### CE-Declaration of Conformity

According to EN 45014

<b>Manufacturer's Name</b>	BTG Pulp & Paper Sensors AB
<b>Manufacturer's Address</b>	P.O. Box 602 S- 661 29 SÄFFLE, Sweden
declares that the product:	
<b>Product Name</b>	Junction box
<b>Model Number</b>	JCT-1200
complies with the amendments and requirements of the:	
	<b>Machinery Directive</b> 89/392/EEC
	<b>Low Voltage Directive</b> 73/23/EEC
	<b>EMC Directive</b> 89/336/EEC
	<b>ETL-Certification</b>
and conforms with the following product standards and PED conformity assessment procedure	
<b>Safety</b>	EN 292/1-2
<b>LVD</b>	EN 61010-1
<b>PED</b>	n..a.
<b>EMC</b>	EN 61000-6-4:2001 EN 61000-6-2:2001
<b>Quality System</b>	ISO 9001 monitored by Lloyd's Register Quality Assurance
<b>Säffle</b>	
<b>Mars 2004</b>	



Tom Gustavsson, MD





## 3 Installation Instructions

### 3.1 Unpacking

The following can be included in a JCT-1200 delivery:

- 1 x JCT-1200 unit
- 1 x CD with documentation
- 1 x Printed manual (optional)
- 1 x Transmitter cable
- 1 x HART-terminal connector (optional)

---

**NOTE!**

There are three delivery options with different hardware configurations. Verify that ordered option is delivered.

---

To verify your delivery option, make sure that the Type-field and the Voltage-field on the type sign matches the type-sign markings specified in table 1.

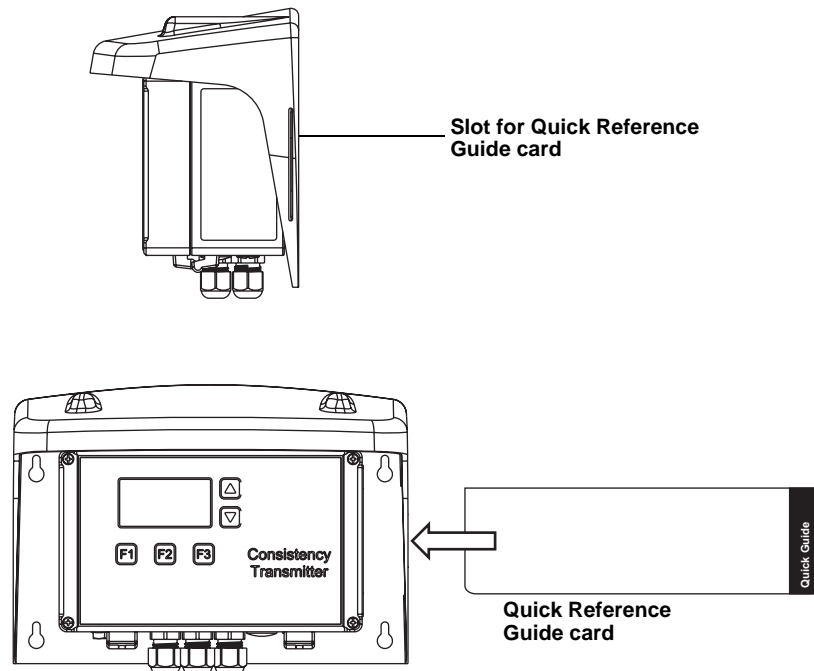
*Table 1: Delivery options*

Delivery option	Type sign markings	
	Type	Voltage
JCT-1200 without optional accessories.	JCT-1200	24 V DC
JCT-1200 with optional power supply unit.	JCT-1200	100-240 V AC
JCT-1200 with optional power supply unit and fieldbus (transmitter accessory).	JCT-1200/FF or JCT-1200/PA	100-240 V AC

## 3.2 Assembly of Product Parts

The protection cover is equipped with a slot for the Quick Reference Guide (QRG) card, which is enclosed with some transmitters. If a QRG card of the type shown in Fig 5 is enclosed with your transmitter, place it in the slot as shown in Fig 5.

**Fig 5 Quick Reference Guide**



### 3.3 Mounting Instructions

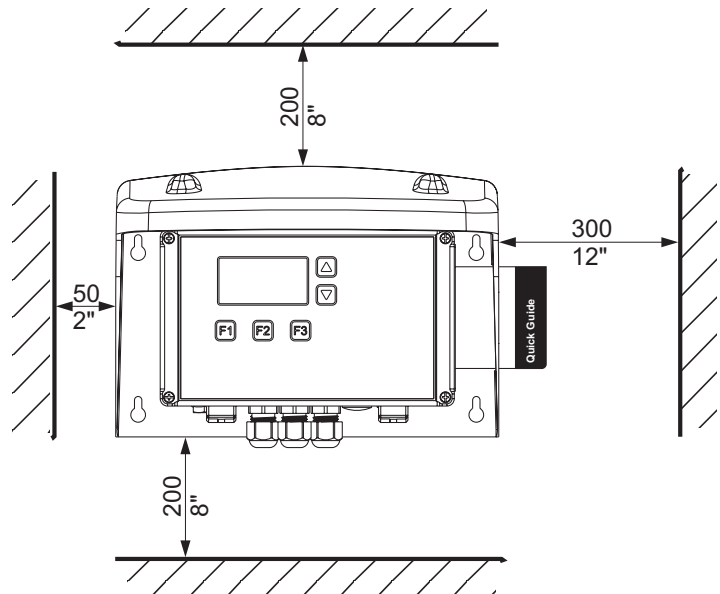
**NOTE!**

If the JCT-1200 is ordered with an optional stand-alone power supply unit, this is mounted at delivery. However if the optional power supply unit is ordered after the JCT-1200 is delivered, then follow the instructions in section 3.6: *Mounting of Optional Accessories*.

1. Choose a location for the junction box. Consider the following points:

- Locate the junction box close to the transmitter and sampling valve to achieve a convenient connection of the SPC-1000 hand-held terminal for calibration and monitoring.
- For a convenient working position, place the junction box at a good operating height.
- Install the box in a position where it is protected from mechanical damage.
- The top of the protective cover is designed to be used as a holder for the SPC-1000 hand-held terminal. Make sure there is sufficient space above the junction box for the SPC-1000. Also make sure that there is sufficient space to handle the QRG card and to connect all cables. See Fig 6 for recommended clearances.

**Fig 6 Recommended clearances**



2. Mount the junction box by bolting the protective cover to a flat surface. Use appropriate bolts.

## 3.4 Cabling Instructions

### 3.4.1 Cable Types

BTG recommends properly dimensioned cables as described below for connecting the junction box to external equipment.

**Power supply cable (Only used when an optional power supply unit is installed):**

- Shielded ( $\geq 80\%$ ) 3 x 0.75 mm<sup>2</sup> (3 x AWG18) with PE.
- The power cable should be in accordance with the IEC 227/245 standard.

---

**NOTE!**

BTG recommends that the power supply cable has a 2 A slow blow fuse.

---

**Signal cables (for Output, Range Select, Alarm, AUX-in, etc.):**

- Shielded (100%) twisted pair: Min. 2 x 0.3 mm<sup>2</sup> (2 x AWG24). Typical size is 2 x 0.75 mm<sup>2</sup> (2 x AWG18).

---

**NOTE!**

BTG recommends that separate cables be used for analog and digital signals. Multiconductor cables can be used.

---

### 3.4.2 Guidelines for Cable Connections

- Do not place signal cables and power supply cables close together! This may cause interference.
- Always avoid loops of cable leads in the junction box and make the leads as short as possible.
- To avoid interference, the shields for the output signal cable must be connected to "SHIELD" on the circuit board as shown in Fig 7.

## 3.5 Connection Instructions

All electrical connections are made directly to the terminal blocks on the circuit board inside the junction box.

To access the circuit board, remove the four screws on the front cover and open the junction box.

### 3.5.1 Wiring Diagram

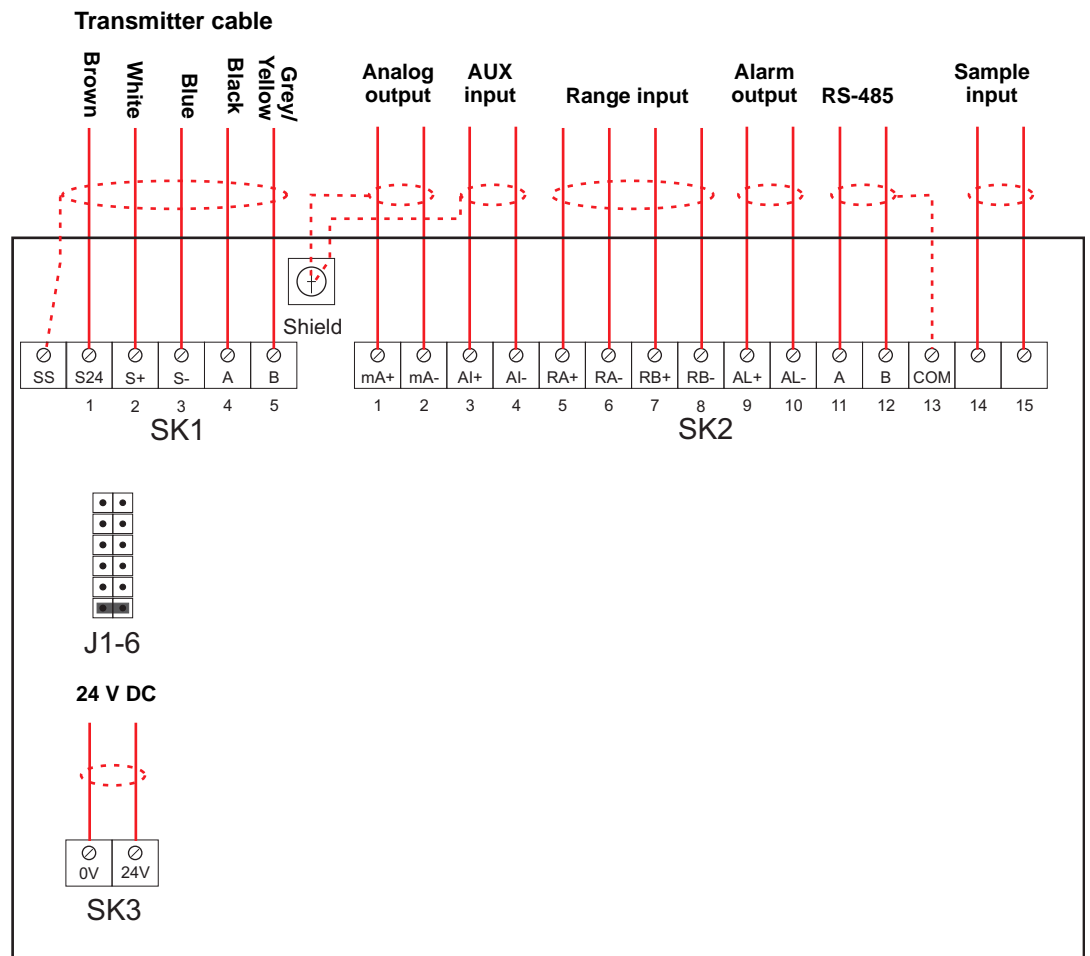
The wiring diagram in Fig 7 shows all possible electrical connections to the junction box.

#### NOTE!

If terminal block SS do not exist, connect sensor shield at the separate terminal marked: Shield.

The transmitter cable is connected to the JCT-1200 at delivery. Power and signal connections must be made according to section 3.5.2. Remaining signal connections are used only if the signals are supported by the transmitter. See the transmitter manual for more information about supported signals.

**Fig 7** Wiring diagram



Explanation of Fig 7 JCT-1200 wiring diagrams.

Cable/Signal	Terminal	Function
Transmitter cable	SS	Sensor shield
	S24	Cable for communication between the transmitter and the JCT-1200.
	S+	
	S-	
	A	
	B	
Analog output	mA+ mA-	Consistency output signal, 4-20 mA
AUX input	AI+ AI-	Analog input, 0 / 4-20 mA
Range input	RA+ RA-	Range select input A. See section 3.5.3: <i>Range Select Input</i> for more information.
	RB+ RB-	Range select input B. See section 3.5.3: <i>Range Select Input</i> for more information.
Alarm output	AL+ AL-	Alarm signal from the transmitter. See section 3.5.4: <i>Alarm Output</i> for more information.
RS-485	A B COM	Reserved for serial communication.
Sample input		Remote sample input contact. See section 3.5.5: <i>Sample Input</i> for more information.
24 V DC	0V 24V	Input for 24 V DC external supply

## 3.5.2 Power and Output signal

The connections for the excitation power and the output signal vary depending on the type of transmitter. There are three different transmitter types:

2-wire transmitter	Uses two wires to simultaneously carry excitation power and the output signal.
3-wire transmitter	Uses three wires to simultaneously carry excitation power and the output signal.
4-wire transmitter	Uses two wires for the output signal and an external 230 V AC/24 V DC supply for the excitation power.

Each transmitter type requires a specific strapping on the jumper block, J1-6, on the circuit board.

Identify your transmitter type and follow the connection instructions in section 3.5.2.1 for 2-wire, section 3.5.2.2 for 3-wire, or section 3.5.2.3 for 4-wire.

---

### NOTE!

The transmitter might require additional settings. Always read the transmitter manual.

---

---

### NOTE!

If the transmitter is equipped with a fieldbus communication interface from BTGs FCI-family, see the relevant FCI manual for connection instructions. However, jumper settings must still be made according to section 3.5.2.3: *4-wire Transmitter*.

---

### 3.5.2.1 2-wire Transmitter

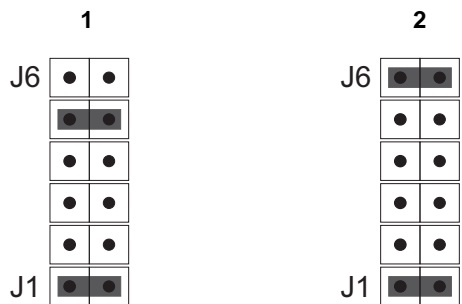
**NOTE!**

Before installation, ensure that all power to the system has been turned off.

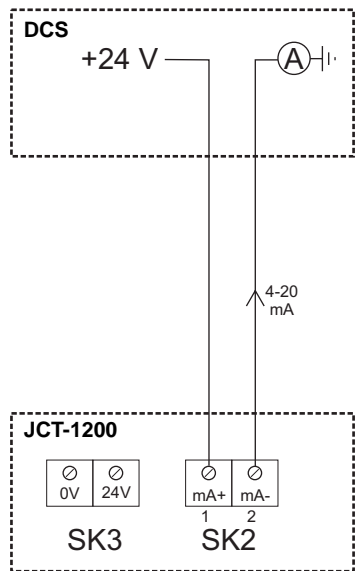


**Fig 8 Jumper settings for a 2-wire transmitter**

- 1 Jumper strappings with HART filter activated
- 2 Jumper strappings with HART filter deactivated



**Fig 9 Power and output signal connection for a 2-wire transmitter**





### 3.5.2.2 3-wire Transmitter

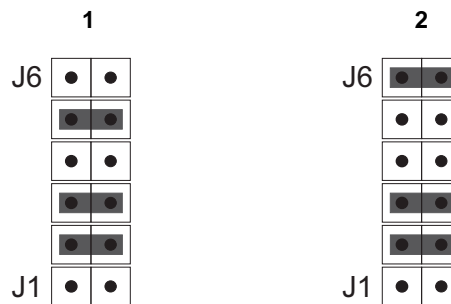
**NOTE!**

Before installation, ensure that all power to the system has been turned off.



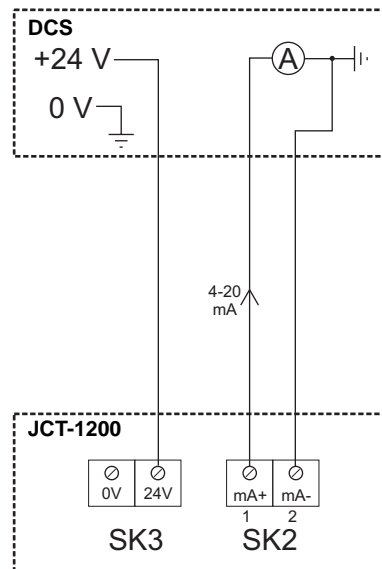
**Fig 10 Jumper settings for a 3-wire transmitter**

- 1 Jumper strappings with HART filter activated
- 2 Jumper strappings with HART filter deactivated



2. Connect the output signal cable to position 1 and to 2 on terminal block SK2, and to position 24V on terminal block SK3, as shown in Fig 11.

**Fig 11 Power and output signal connection for a 3-wire transmitter**



### 3.5.2.3 4-wire Transmitter



Fig 12 JCT-1200 with power supply unit

**NOTE!**

Before installation, ensure that all power to the system has been turned off.

A 4-wire transmitter requires that the junction box is equipped with an optional power supply unit.

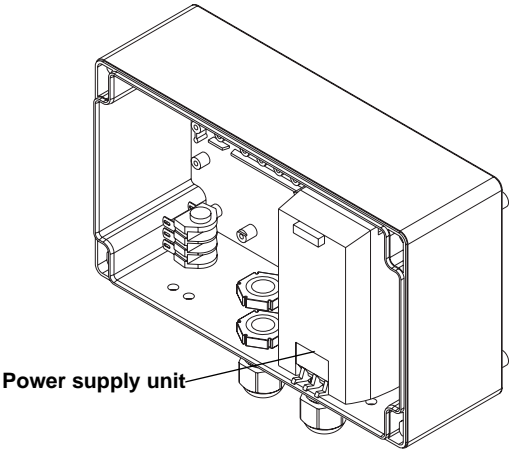
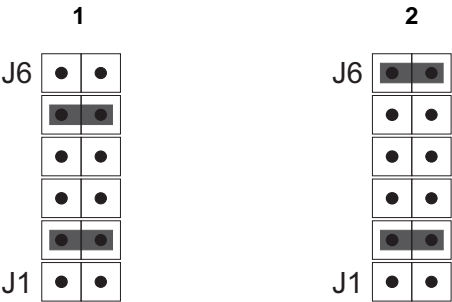


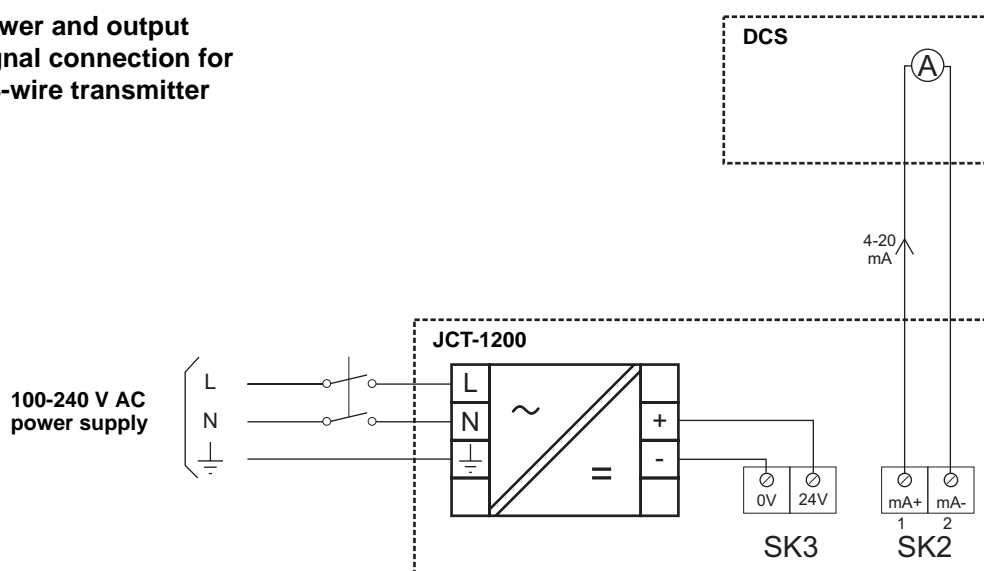
Fig 13 Jumper settings for a 4-wire transmitter

1. Strap the jumper block according to one of the examples shown in Fig 13, depending on whether the HART filter is to be activated or not. For more information about HART-communication, see section 7.1: *HART-communication*.



2. Connect the output signal cable to position 1 and 2 on terminal block SK2 as shown in Fig 14.
3. Connect the power supply cable to the power supply unit as shown in Fig 14.

**Fig 14 Power and output signal connection for a 4-wire transmitter**



**NOTE!**

An external 2-pole switch close to the JCT-1200 unit is required.

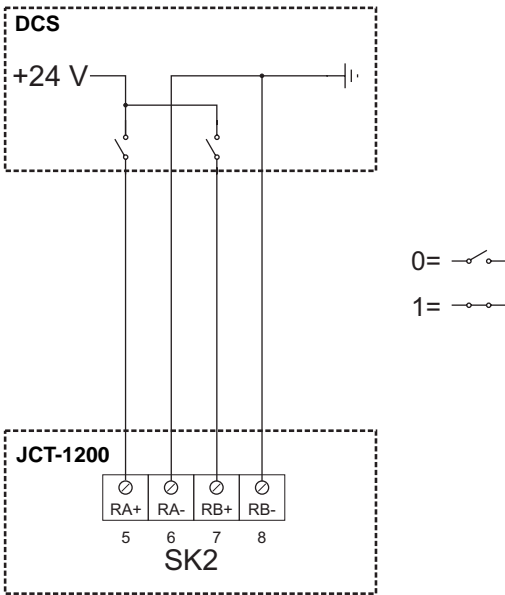
### 3.5.3 Range Select Input

This section is only applicable if the transmitter supports multiple calibration ranges. See the transmitter manual for more information.

Transmitter calibration ranges for different production circumstances can be changed with binary inputs to the transmitter. A total of four different ranges are available.

Connect the range selection cable as shown in Fig 15. The table below shows the binary inputs for each range. If the range input is not used, range 1 is selected by default.

**Fig 15 Range select input**



Range	Input A	Input B
1	0	0
2	1	0
3	0	1
4	1	1

### 3.5.4 Alarm Output

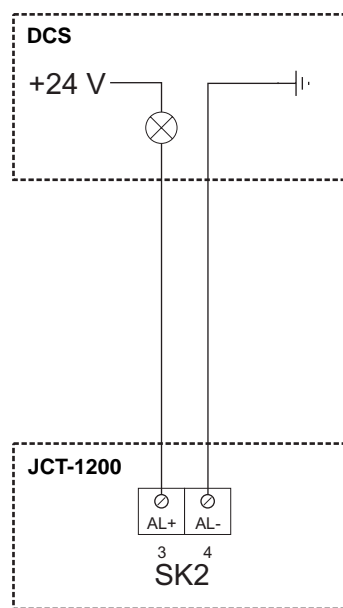
This section is only applicable if the transmitter has an alarm function. Refer to the transmitter manual for more information.

A software-controlled alarm output with an opto-coupled Solid State Relay (SSR) from the transmitter is available. The SSR is closed when there is no alarm and open when there is an alarm.

The alarm is fail safe, for example if power to the transmitter fails, the SSR will open.

Connect the alarm cable as shown in Fig 16. The external power supply for the alarm signal must not exceed 30 V DC or 50 mA.

**Fig 16 Alarm output**



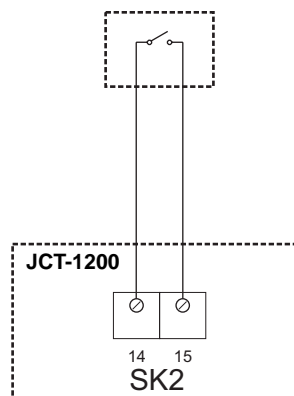
### 3.5.5 Sample Input

This section is only applicable if the transmitter supports the usage of an external sample switch. Refer to the transmitter manual for more information.

An external switch, used to automatically take samples from a remote location, can be connected to the JCT-1200.

Connect the switch to position 14 and 15 on terminal block SK2 as shown in Fig 17.

**Fig 17 Sample Input**



A sample is taken when the switch is closed. Before another sample can be taken, the switch has to be opened again.

## 3.6 Mounting of Optional Accessories

### 3.6.1 Unpacking of Upgrade Kit A0082685

Ensure that the following items are included in the Upgrade Kit A0082685 delivery:

- 1 x PULS ML50.100 power supply unit
- 1 x Bracket
- 2 x Screw RXK-H ST2 9x9.5
- 1 x DC cable set
- 1 x Label set

### 3.6.2 Installation of Power Supply Unit

#### 3.6.2.1 Upgrade Preparation

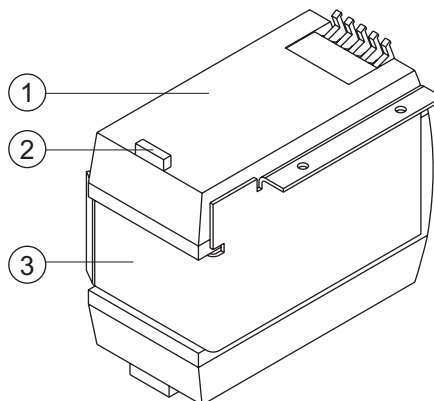
1. Remove the four screws on the front cover and open the junction box.
2. Loosen any wire connected to position mA+ and mA- on terminal block SK2, and position 0V and 24V on terminal block SK3.

#### 3.6.2.2 Bracket Mounting

1. Press down and hold the release button on the back of the power supply unit.
2. Place the bracket as shown in Fig 18.

**Fig 18 Bracket mounting**

- 1 Power supply unit
- 2 Release button
- 3 Bracket

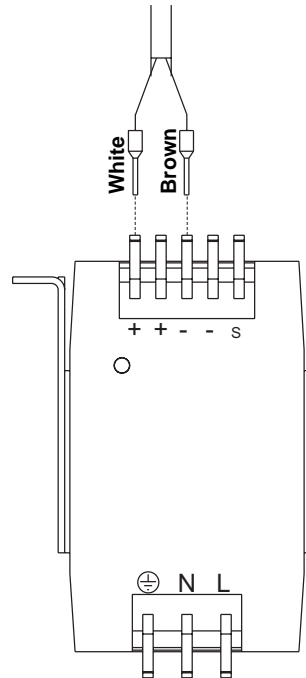


3. Release the release button to lock the bracket in position.

### 3.6.2.3 Power Supply Unit Mounting

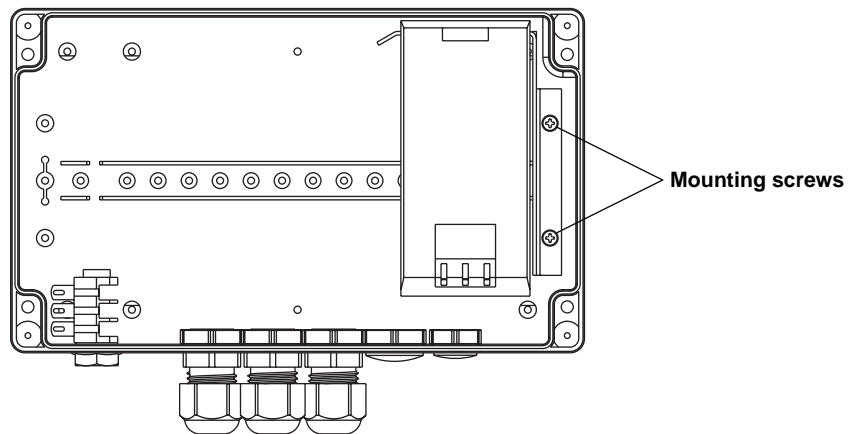
1. Connect the enclosed DC cable to the power supply unit as shown in Fig 19.

**Fig 19 Connection of DC cable**



2. Mount the power supply unit to the inner wall of the junction box using the enclosed mounting screws, as shown in Fig 20.

**Fig 20 Mounting of power supply unit**



### 3.6.2.4 Label Mounting

1. Affix the warning label on lower left surface on the front panel.
2. Affix the type sign over the old one, and seal with the PVC label.





### 3.6.2.5 Electrical Connection

#### NOTE!

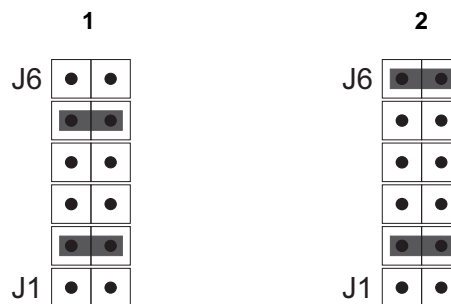
Before installation, ensure that all power to the system has been turned off.

#### NOTE!

If the transmitter is equipped with a fieldbus communication interface from BTG's FCI-family, refer to the relevant FCI manual for connection instructions. However, jumper settings must still be made according to the instructions in this section.

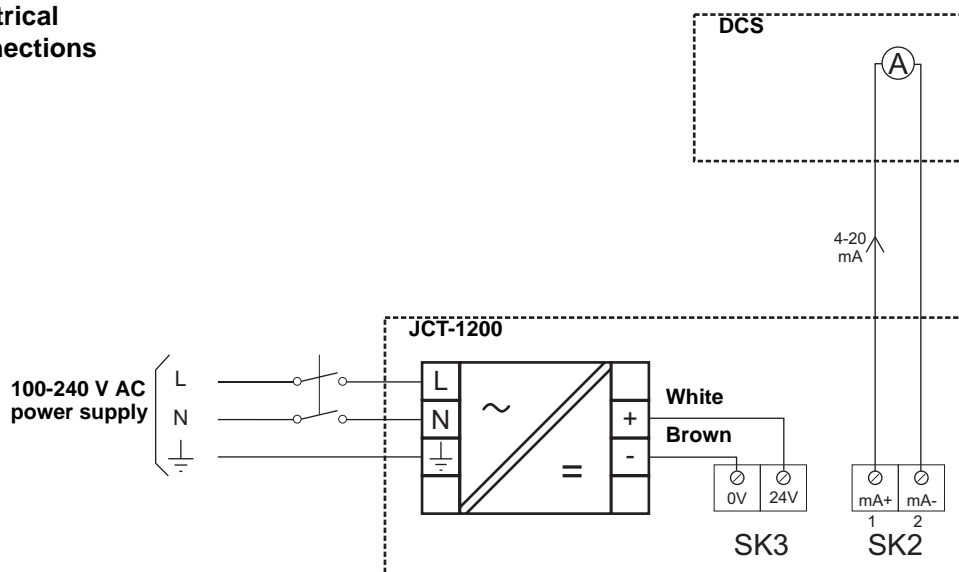
**Fig 21 Jumper settings**

- 1 Jumper strappings with HART filter activated
- 2 Jumper strappings with HART filter inactivated



2. Connect the DC cable from the power supply unit to position 0V and 24V on terminal block SK3, as shown in Fig 22.
3. Connect the output signal cable to the position 1 and 2 on terminal block SK2 as shown in Fig 22.
4. Connect the power supply cable to the power supply unit as shown in Fig 22.

**Fig 22 Electrical connections**





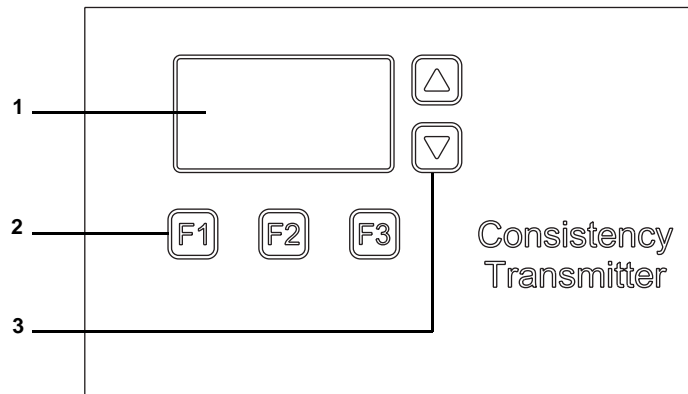
## 4 Operating Instructions

### 4.1 General Information

The JCT-1200 user interface consists of a display, three function keys (**F1**, **F2** and **F3**), and two scroll keys (**Up** and **Down**). All are located on the front panel of the junction box.

**Fig 23 JCT-1200 front panel**

- 1 Display
- 2 Function keys
- 3 Scroll keys



The display is provided with a backlight, which works differently depending on the type of transmitter. For 3-wire and 4-wire transmitters, the backlight is powered from the external power supply and is constant. For 2-wire transmitters, a backup battery supplies power to the backlight. The battery can provide power for up to two hours of continuous backlight, and is recharged via the 4-20 mA loop. The backlight for 2-wire transmitters is controlled by the transmitter.

If a 2-wire transmitter is used, BTG recommends that the JCT-1200 has the display backlight disabled during the first week of usage, to ensure that the battery gets fully charged. Usage of the JCT-1200 with discharged battery might cause the display to flicker or shutdown. See the transmitter manual for instructions on how to configure the backlight settings.

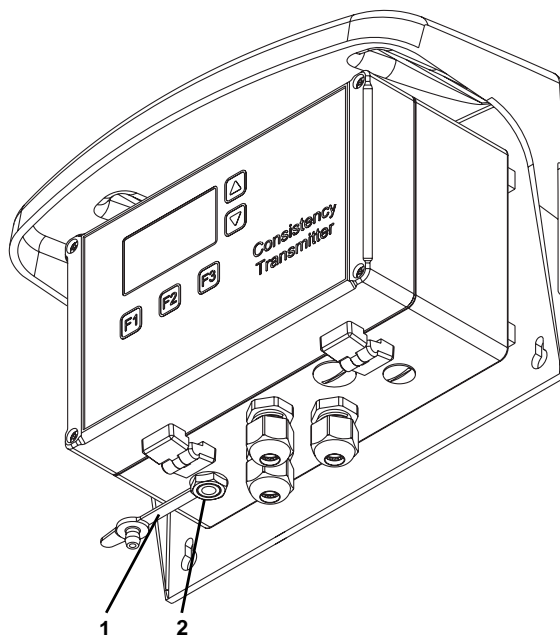
The function keys and scroll keys have different functions depending on transmitter type and where in the software user interface the operator is.

## 4.2 SPC-1000 and HART Terminal Connections

A SPC-1000 hand-held terminal or a standard HART terminal can, at any time, be connected to the JCT-1200. Both terminal types are connected to the same connector on the base of the JCT-1200, using a Ø1/4" telephone plug. See Fig 24.

**Fig 24 SPC-1000 and HART terminal connections**

- 1 Protective plug
- 2 SPC-1000 connector



The usage of a HART-terminal requires an adapter, which is available from BTG as an optional accessory:

- **Adapter for HART-terminal connection, Art. no:A0082859**

### NOTE!

The protective plug must always be plugged into the SPC-1000 connector to maintain the degree of protection, when no terminal is connected to the JCT-1200.

## 4.3 Operation

The JCT-1200 works solely as a terminal, and is controlled by the transmitter software. This means that all operations of the JCT-1200 are transmitter-specific and are therefore not described in this manual.

For further operating instructions, refer to the transmitter manual.



## 5 Service Instructions

### 5.1 Maintenance Routines

No regular maintenance for the JCT-1200 is needed apart from keeping the junction box clean and free from pulp.

### 5.2 Repair

#### 5.2.1 Circuit Board Replacement

The circuit board should be replaced when the JCT-1200 is not operating properly and troubleshooting procedures have indicated an error in the circuit board.

---

**NOTE!**

Before commencing the replacement, ensure that all power to the system has been turned off.

---

##### 5.2.1.1 Remove the Circuit Board

Tools required:
Star screwdriver (medium size) Screwdriver (small size) Block wrench 5 mm

1. Remove the four screws on the front panel and open the junction box.

---

**NOTE!**

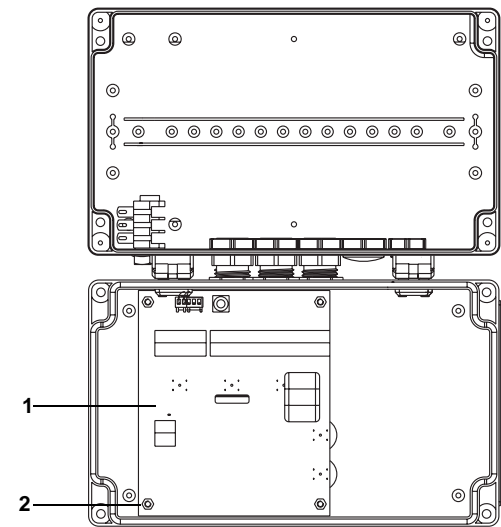
Before proceeding with the replacement, make a note of how all wires are connected to the circuit board, and how the jumper block is strapped.

---

**Fig 25 JCT-1200 Circuit board**

- 1 Circuit board
- 2 Spacer

- 2. Loosen all connected cables from the circuit board (1).



- 3. Remove the four spacers (2) that attach the circuit board to the front panel of the junction box.
- 4. Lift out the circuit board.

**5.2.1.2 Mount the Circuit Board**

<b>Spare parts required:</b>
Circuit board
<b>Tools required:</b>
Star screwdriver (medium size) Screwdriver (small size) Block wrench 5 mm

- 1. Mount the new circuit board to the front panel using the four spacers.
- 2. Reconnect all cables to the new circuit board, according to the notes made during removal of the old circuit board.
- 3. Strap the jumper block on the new circuit board the same way as the old circuit board.
- 4. Close the junction box and fasten the front panel.



## 5.2.2 Transmitter Cable Replacement

The transmitter cable should be replaced when:

- There is a cable breakdown.
- The cable connector is broken.

### NOTE!

Before commencing the replacement, ensure that all power to the system has been turned off.

### 5.2.2.1 Remove the Transmitter Cable

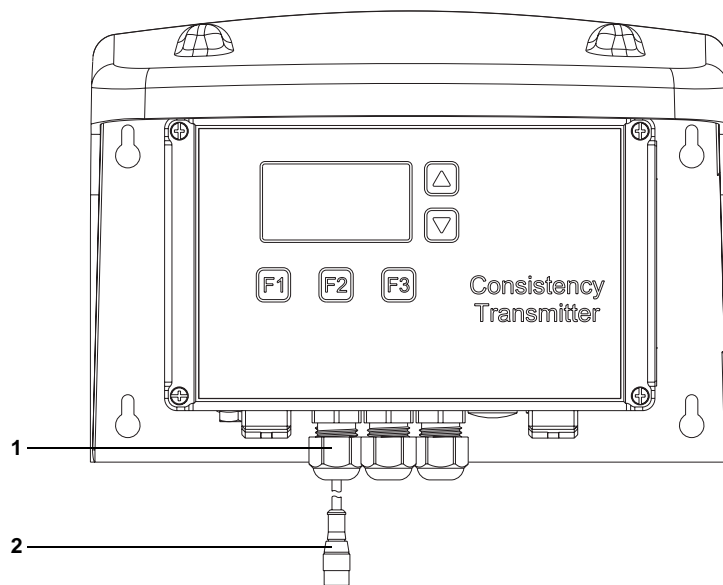
#### Tools required:

Star screwdriver (medium size)  
Screwdriver (small size)  
Block wrench 20 mm

1. Loosen the nut from the cable gland used for the transmitter cable entry.

**Fig 26 Transmitter cable entry**

- 1 Cable gland nut
- 2 Transmitter cable



2. Remove the four screws on the front cover and open the junction box.
3. Loosen all the transmitter cable wires from terminal block SK1 on the circuit board.
4. Pull out the transmitter cable from the JCT-1200.

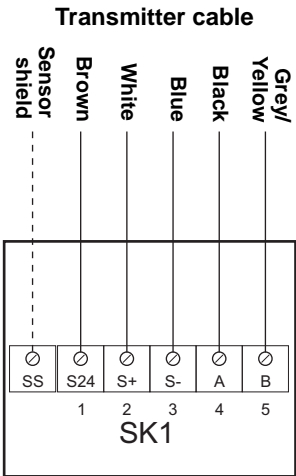
5.2.2.2 Mount the Transmitter Cable

<b>Spare parts required:</b>
Transmitter cable
<b>Tools required:</b>
Star screwdriver (medium size) Screwdriver (small size) Block wrench 20 mm Stripping pliers

1. Strip the covering of the new transmitter cable so that the free wires are approximately 100-150 mm long.
2. Strip the ends of the free wires.
3. Enter the new transmitter cable through the cable gland.
4. Connect the transmitter cable wires to terminal block SK1 on the circuit board, as shown in Fig 27.

Fig 27 Transmitter cable connections

- 1 Cable gland nut
- 2 Transmitter cable



5. Close the junction box and fasten the front panel.
6. Tighten the cable gland nut.

### 5.2.3 Power Supply Unit Replacement

The optional power supply unit should be replaced when the JCT-1200 is not operating properly and troubleshooting procedures have indicated that the power supply unit is faulty.

**NOTE!**

Before commencing the replacement, ensure that all power to the system has been turned off.

#### 5.2.3.1 Remove the Power Supply Unit



**Tools required:**

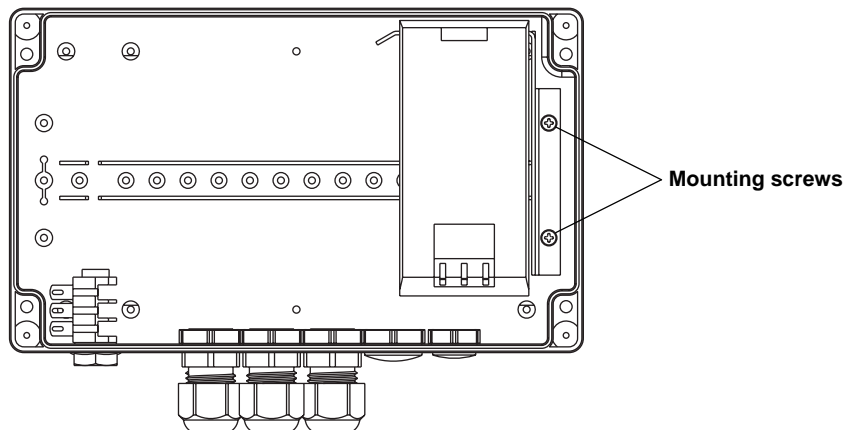
Star screwdriver (medium size)  
Screwdriver (small size)

1. Remove the four screws on the front cover and open the junction box.

**NOTE!**

Before disconnecting the power wires, make a note of how the wires are connected.

2. Loosen the wires from the 100-240 V AC power supply cable.
3. Remove the mounting screws.



4. Lift the power supply unit until the connections from the 24 V DC cable are visible.
5. Loosen the wires from the 24 V DC cable and remove the power supply unit.
6. Loosen the DC cable wires from terminal block SK3 on the circuit board and remove the DC cable.

**Fig 28 Removal of power supply unit**



### 5.2.3.2 Mount the Power Supply Unit

<b>Spare parts required:</b>
Power supply kit
<b>Tools required:</b>
Star screwdriver (medium size) Screwdriver (small size)

1. Install the power supply unit according to the instructions in section 3.6.2.2 to section 3.6.2.4.
2. Close the junction box and fasten the front panel.

## 5.2.4 Casing Replacement

The casing should be replaced when:

- There is visible damage to the box or protective cover.
- The hinges are broken.
- The cable glands are cracked or broken.
- The SPC-1000 connection unit is faulty.

A new casing includes a complete JCT-1200, except for the following parts:

- Circuit board
- Transmitter cable
- Power supply unit (optional)
- Fieldbus communication interface (optional)

Before replacing the casing, these parts need to be moved from the old casing.

---

**NOTE!**

Before commencing the replacement, ensure that all power to the system has been turned off.

---

### 5.2.4.1 Disassemble the Junction Box

Tools required:
Star screwdriver (medium size) Screwdriver (small size) Block wrench 5 mm, 20 mm

1. Remove the circuit board according to section 5.2.1.1: *Remove the Circuit Board*.
2. If the JCT-1200 is equipped with an optional power supply unit, remove the power supply unit according to appropriate steps in section 5.2.3.2: *Mount the Power Supply Unit*.
3. If the JCT-1200 is equipped with a fieldbus communication interface from BTG's FCI-family, remove the FCI converter card according to instructions in the appropriate FCI manual.
4. Loosen all cable gland nuts and pull out all cables from the junction box.

#### 5.2.4.2 Replace the JCT-1200 Casing

<b>Spare parts required:</b>
JCT-1200 spare part kit, casing

<b>Tools required:</b>
Torque wrench

1. Loosen the bolts that hold the casing mounted to the wall, without removing them.
2. Lift down the casing.
3. Attach the new casing to the bolts and tighten the bolts.

#### 5.2.4.3 Assemble the Junction Box

<b>Tools required:</b>
Star screwdriver (medium size) Screwdriver (small size) Block wrench 5 mm, 20 mm

1. Attach the circuit board to the front panel of the new box.
2. If the JCT-1200 is equipped with an optional power supply unit, mount the power supply unit in the new casing according to section 3.6.2.3 on page 26.
3. If the JCT-1200 is equipped with a fieldbus communication interface from BTG's FCI-family, mount the FCI converter card according to instructions in the appropriate FCI manual.
4. Reconnect all cables to the circuit board and to the power supply unit if used.
5. Close the junction box and fasten the front panel.

## 5.3 Alarm Handling

All alarms from the JCT-1200 are generated and handled by the transmitter. Refer to the transmitter manual for alarm handling.

## 5.4 Troubleshooting

This section only covers troubleshooting with regard to possible faults that can occur in the junction box. Please refer to the transmitter manual for transmitter related problems.

Probable causes are listed in a logical order in the troubleshooting table below. They should be checked in that order.

Symptom	Probable Cause	Action
1. There is no information on the display.	1.1. No power to the junction box	Check the external power supply voltage.
	1.2. Faulty or incorrectly connected cabling to the power supply unit <sup>(a)</sup>	Check the AC power and 24 V DC wiring.
	1.3. Faulty 24 V DC supply <sup>(a)</sup>	Check the output voltage from the power supply unit. If faulty, replace the power supply unit. See section 5.2.3.
	1.4. Faulty or incorrectly connected cabling to the terminal blocks <sup>(b)</sup>	Check the power and signal wiring. See section 3.5.2.1 for 2-wire transmitters and section 3.5.2.2 for 3-wire transmitters.
	1.5. Incorrect strapping on the jumper block	Strap the jumper block according to the instructions for the concerned transmitter type. See section 3.5.2.
	1.6. Display is faulty	Replace the circuit board. See section 5.2.1.
2. Flickering display, or no backlight on the display when the buttons are pressed <sup>(b)</sup> .	2.1. The battery on the circuit board is discharged	Disable the backlight, according to the transmitter manual, and let the battery recharge from the excitation power for a couple of days
	2.2. Battery is faulty	Replace the circuit board. See section 5.2.1.
	2.3. Display is faulty	Replace the circuit board. See section 5.2.1.
3. Nothing happens when the push buttons are used.	3.1. One or more push buttons are faulty	Replace the circuit board. See section 5.2.1.
4. There is no output signal.	4.1. No power to the junction box	Check the external power supply voltage
	4.2. Transmitter not in operation	Check the display for output signal
	4.3. Open loop for 4-20 mA output	Check the complete 4-20 mA loop for breaks
	4.4. Incorrect transmitter analog out configuration	See the transmitter manual for calibration instructions

Symptom	Probable Cause	Action
5. The analog output signal from the junction box differs from what is shown on the display.	5.1. Incorrect transmitter analog out configuration	See the transmitter manual for calibration instructions
6. The calibration range cannot be changed.	6.1. Cabling or DCS output is faulty	Check the range input signal on the terminal blocks. If the signal is low, the cabling or the DCS outputs are probably faulty. Check the cabling and all wire connections. Replace the cabling if necessary.  If the cabling is OK, consult the trouble shooting documentation for the DCS.
	6.2. Circuit board is faulty	Check the range input signal on the terminal blocks. If the signal is high, the circuit board is probably faulty. Replace the circuit board according to section 5.2.1.
7. The external sample switch does not work.	7.1. Cabling or sample switch is faulty	Check the sample input signal on the terminal blocks. If the signal is high, the cabling or the sample switch is probably faulty. Check the cabling and all wire connections. Replace the cabling if necessary.  If the cabling is OK, check if the switch is faulty and replace if necessary.
	7.2. Circuit board is faulty	Check the input signal on the sample input on the terminal blocks. If the signal is low, the circuit board is probably faulty. Replace the circuit board according to section 5.2.1
8. No alarm signal from the JCT-1200.	8.1. The transmitter does not support an alarm function	Consult the transmitter manual to verify that an alarm function is supported
	8.2. Cabling or DCS output is faulty.	Check the alarm output signal on the terminal blocks. If the signal is high, the cabling or the DCS input is probably faulty. Check the cabling and all wire connections. Replace the cabling if necessary.  If the cabling is OK, consult the trouble shooting documentation for the DCS.
	8.3. Circuit board is faulty.	Check the alarm output signal on the terminal blocks. If the signal is low, the circuit board is probably faulty. Replace the circuit board according to section 5.2.1

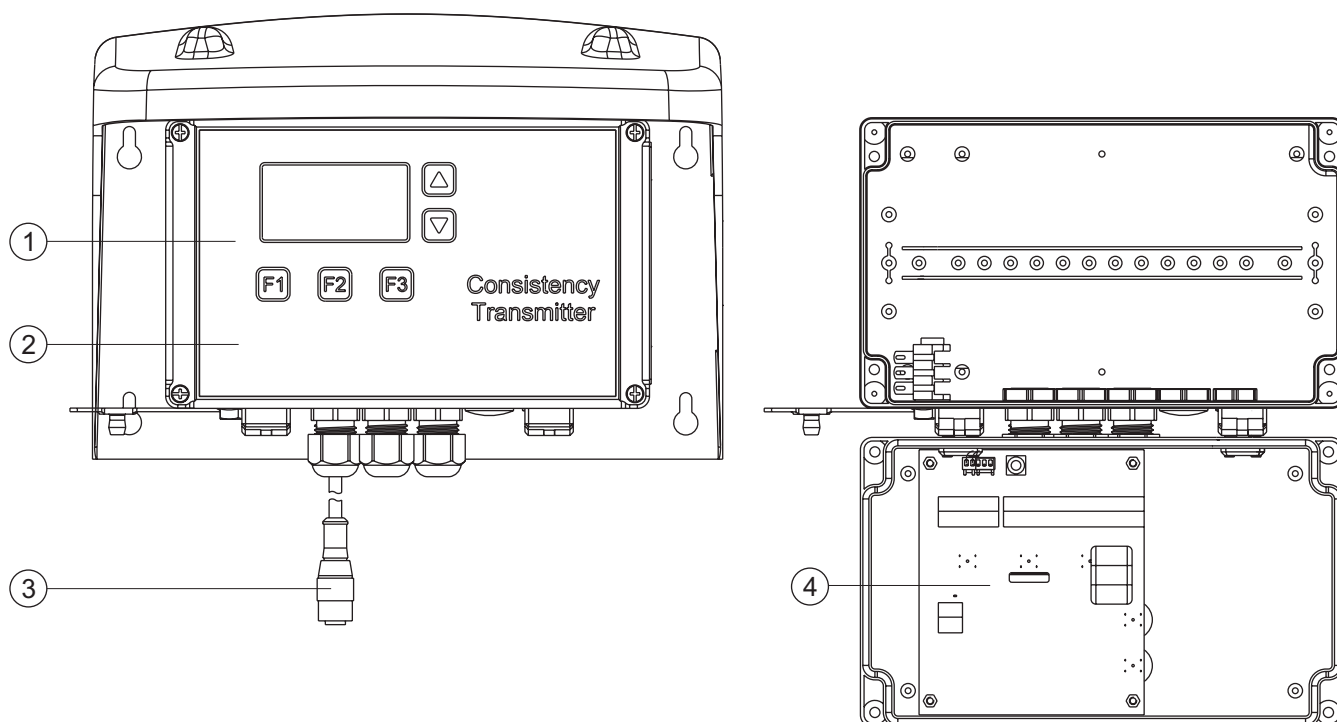
(a) Only valid when the JCT-1200 is equipped with an optional power supply unit.

(b) Only valid when the JCT-1200 is not equipped with an optional power supply unit.



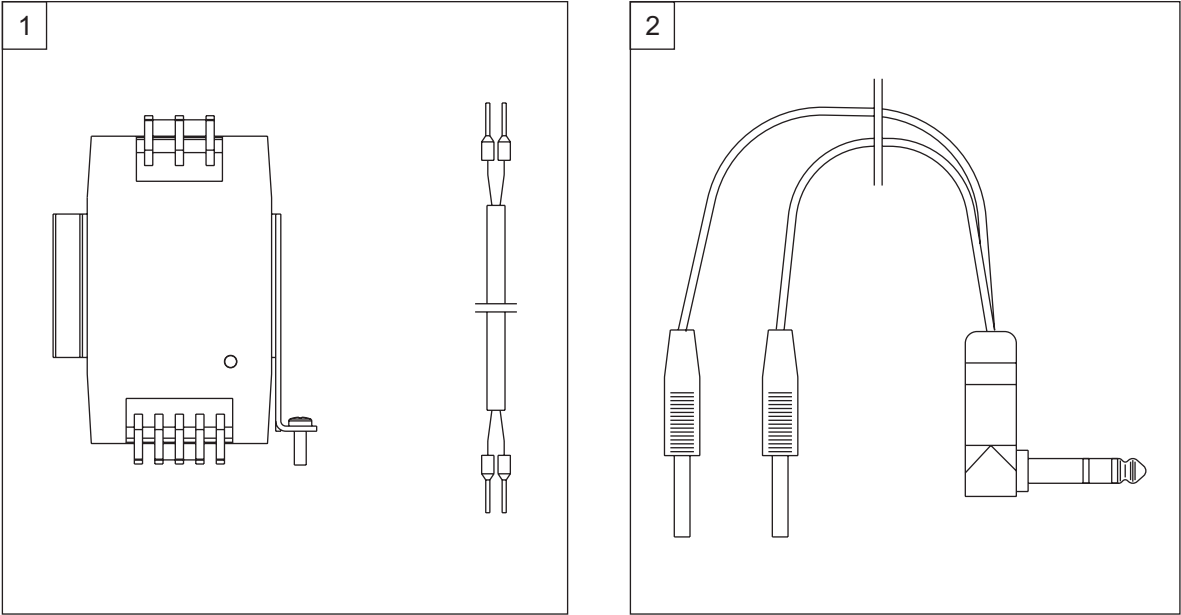
## 6 Spare Parts

### 6.1 JCT-1200 Junction Box



Item No.	Rec. spare parts	Qty	Part No.	Spare Part	Description
1	1		A0068239	JCT-1200 junction box, complete	
2	1		A0082859	JCT-1200 spare part kit, casing	Same as A0068239, but without transmitter cable and circuit board
3	1		46031019	Transmitter cable	
4	1		A0068254	Circuit board	

## 6.2 Accessories



Item No.	Rec. spare parts	Qty	Part No.	Spare Part	Description
5		1	A0082685	Power supply kit, complete	
6		1	A0082859	Adapter for HART terminal connection	

## 7 Appendix

### 7.1 HART-communication

The JCT-1200 is delivered with a HART filter that removes the superimposed HART signal on the analog output signal from the junction box to the DCS, etc. If the HART-protocol is used after the junction box, the HART filter must be inactive. See section 3.5.2: *Power and Output signal*.

BTG's hand-held terminal (SPC-1000) use the HART-protocol for communication between the transmitter and the junction box. The HART communication requires a 250 ohm minimum loop resistance, which is normally provided by the HART filter. If the HART filter is inactivated, it must be verified that the output circuit (DCS, etc.) has at least 250 ohms resistance. If this is not the case, then an extra resistor must be connected in series with the output signal cable. Always connect the resistor to the plus (mA+) terminal.

## 7.2 JCT-1200 Test and Diagnostic Software

The JCT-1200 contains embedded software for test and diagnostic purposes. The software monitors various input signals, as well as the RS-485 data communication between the JCT-1200 and the transmitter. It can also be used to test various functions of the JCT-1200. The software is accessed and handled through the JCT-1200 display and function keys.

### 7.2.1 Test and Diagnostic Software Access

To access the software, press and hold the **F1** and **UP Arrow** keys at the same time for at least 1 second.

To exit the software, press the **exit (F1)** key, or leave the JCT-1200 idle for three minutes.

### 7.2.2 Test and Diagnostic Software Overview

#### 7.2.2.1 Diagnostics

This section describes all displayed diagnostics.

**Fig 29** Displayed diagnostics in the Test and Diagnostic Software

	1	2	3
4	Bsy=0	Rq=100	Ok=100
5	Master A0/A1	Off/Off	
6	Range RA/RB	Off/Off	
7	Sample input	Off	
	Analog in AI	1023	
8	2-wire mode	YES	
	Battery low	NO	
9	Exit Alarm	AlmLED	

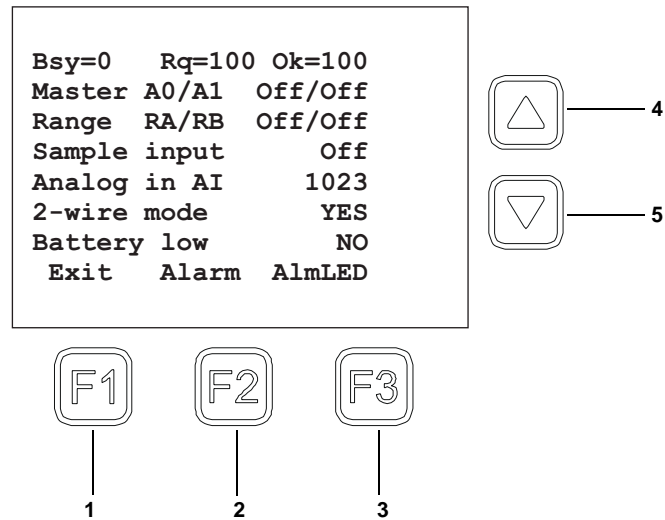
1. Bsy (Busy)  
The volume of RS-485 traffic not generated by the JCT-1200, in relation to the maximum capacity.  
Value range: 0-100%.
2. Rq (Requests)  
The number of commands sent from the JCT-1200.  
Value range: 0-100. When more than 100 commands have been sent, the value 100 will constantly be displayed.
3. Ok (Response OK)  
The number of commands successfully received by the transmitter, out of the last 100 commands sent from the JCT-1200.  
Value range: 0-100.
4. Master A0, A1  
Status of the JCT-1200 master address setup. For BTG internal use only.  
Value range: On or Off.

5. Range RA, RB  
Status of the digital range select input signals.  
Value range: On or Off.
6. Sample Input  
Status of the digital sample input signal. Value range: On or Off.
7. Analog in AI  
Digital value of the analog AUX input signal.  
Value range: 0-1023, where 0 corresponds to 0 mA and 1023 corresponds to 21.5 mA.
8. 2-wire mode  
Status of the transmitter power supply configuration. Indicates if the JCT-1200 is configured for use with a 2-wire transmitter.  
Value range: Yes or No
9. Battery low  
Status of the JCT-1200 battery charging. Indicates if the battery is discharged.  
Value range: Yes or No

### 7.2.2.2 Function Keys

This section describes the function of each function key in the Test and Diagnostics Software.

**Fig 30 Function keys in the Test and Diagnostic software**



1. Exit (F1)  
Exits the Test and Diagnostic Software.
2. Alarm (F2)  
Function test of the alarm. Pressing the Alarm (F2) key will switch the alarm output from closed (no alarm) to open (alarm), and vice versa. When the alarm output is open, the text "Alarm" on the display is shown as white on black background.
3. AlarmLED (F3)  
Function test of the alarm LED. Pressing the AlmLED (F3) key will switch the alarm LED from off to on, and vice versa. When the alarm LED is on, the text "AlmLED" on the display is shown as white on black background.
4. Up Arrow  
Pressing the Up Arrow key will turn the on display backlight for about three seconds.
5. Down Arrow  
Pressing the Down Arrow key will turn off the display backlight.