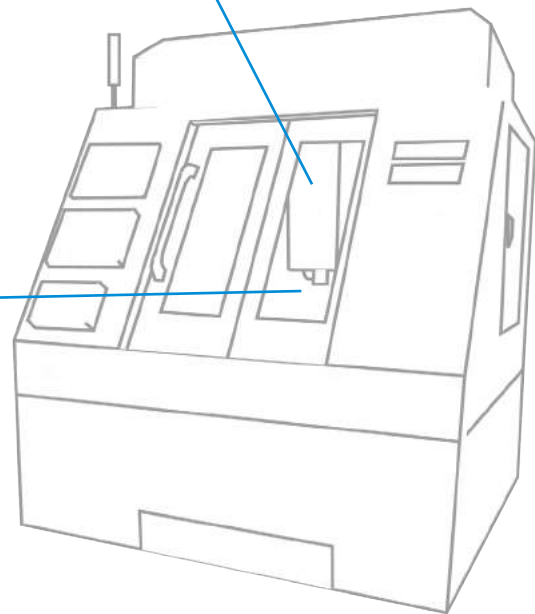


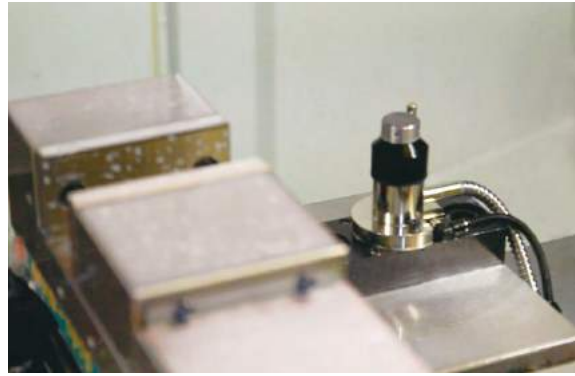
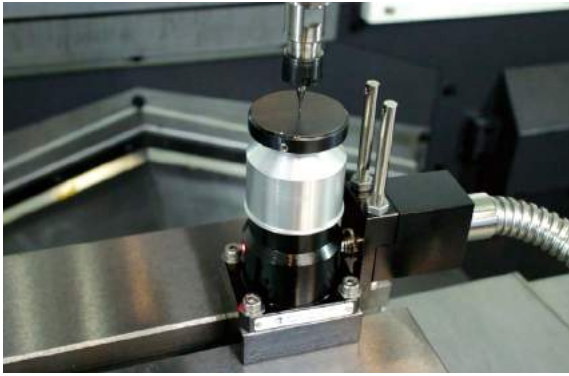
Tool Setter

for CNC Machine Centers

2016



Keep Sensing
Keep Loving
Keep Moving



Application

± 0

Zero Presetting



Abrasion & Breakage Detection



Length Compensation

Advantage

- ✓ 24hrs continuous production
- ✓ Shorten the span of tool setting procedure
 - ✓ Guarantee the yield
 - ✓ Reduce human power



Tsense Factory

INDEX

BT12 Series BT12/BT1220-II/BTH1220
CNC tapping center.....P3-P5

BT20 Series BT20-II/BT2030-II/BT2040-II
CNC machine.....P6-P8

BTF Series BTF1-R/BTF2-R/BTFC1-R-II
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B4A
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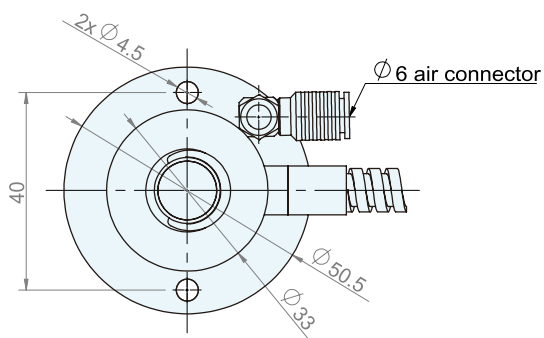
Installation
.....P18





- For CNC Tapping Center
- ø12

Dimensions



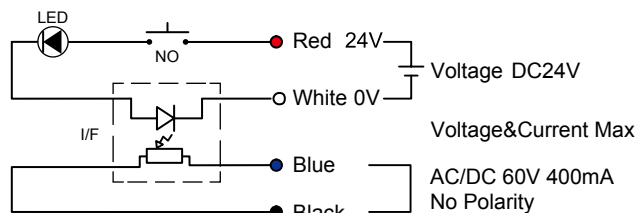
Specifications

Item	BT12
Repeatability	2µm
Pretravel distance	≅ 0
Contact life time	3 Millions
Travel distance	5mm
Contact force	2.0N
Standard cable length	cable 3M/ protect house 2.5M
Over travel dist	≅ 2.5mm
Protective	IP68

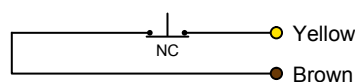
Circuit Configurations

Standard : build-in I/F

Schematic Circuit

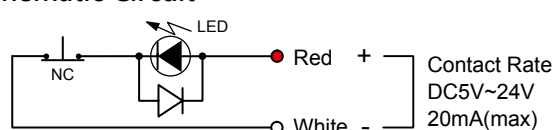


Over Travel Schematic Circuit

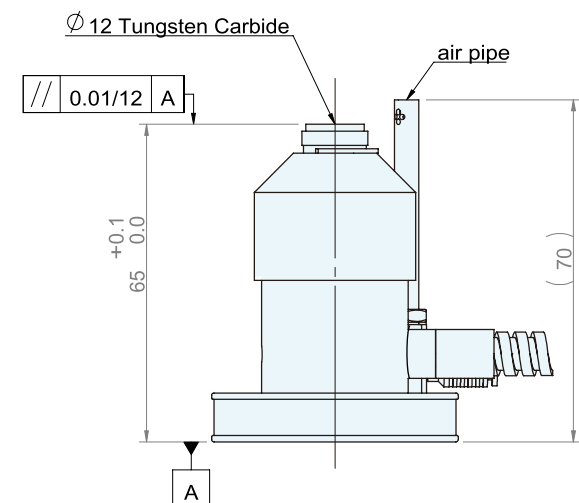
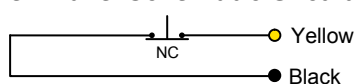


Optional : no build-in I/F

Schematic Circuit



Over Travel Schematic Circuit



Notice

Power off before installation and uninstallation, in case of damage happened because of a wrong connection.

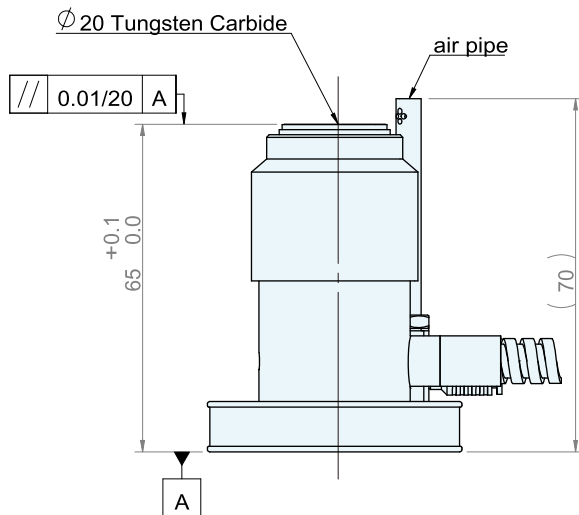
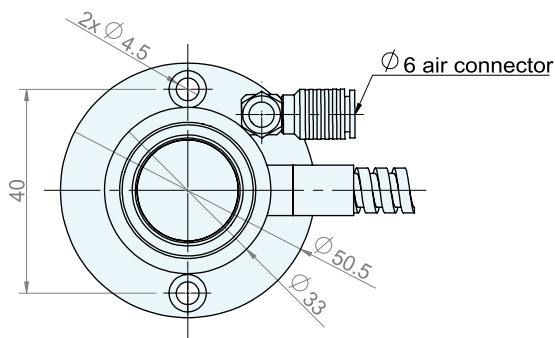
AC is not allowed. Be aware of the contact rate is DC 24V max.

Be aware of the contact rate is 20mA max of no build-in I/F.



- For CNC Tapping Center
- ø20

Dimensions



Notice

Power off before installation and uninstallation, in case of damage happened because of a wrong connection.
 AC is not allowed. Be aware of the contact rate is DC 24V max.
 Be aware of the contact rate is 20mA max of no build-in I/F.

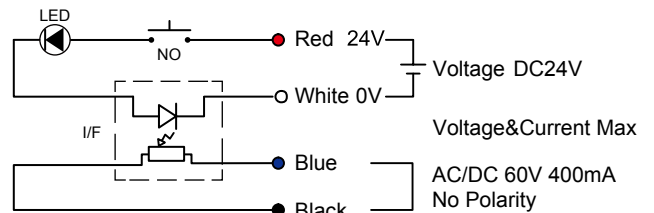
Specifications

Item	BT1220-II
Repeatability	2µm
Pretravel distance	≅ 0
Contact life time	3 Millions
Travel distance	5mm
Contact force	2.0N
Standard cable length	cable 3M/ protect house 2.5M
Over travel dist	≅ 2.5mm
Protective	IP68

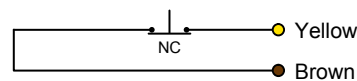
Circuit Configurations

Standard : build-in I/F

Schematic Circuit

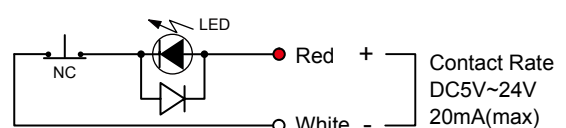


Over Travel Schematic Circuit

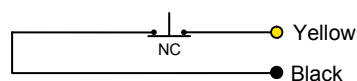


Optional : no build-in I/F

Schematic Circuit



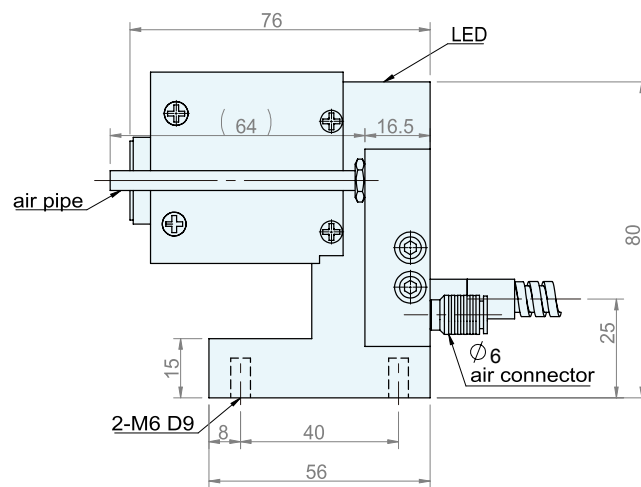
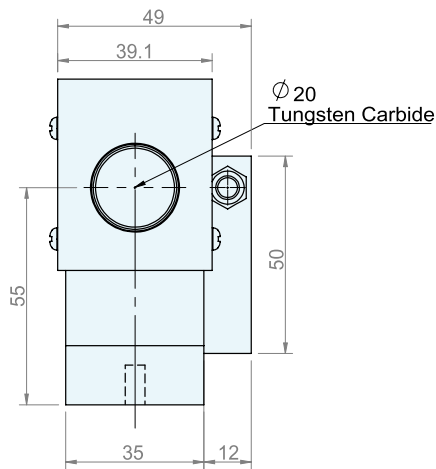
Over Travel Schematic Circuit





- For Horizontal Machining Center
- $\varnothing 20$

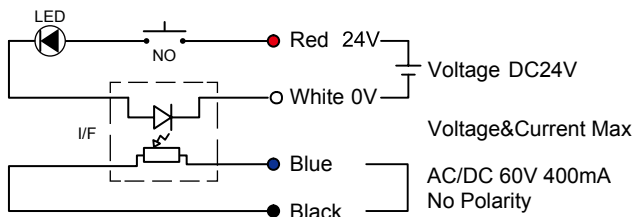
Dimensions



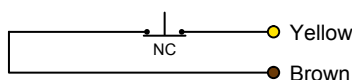
Circuit Configurations

Standard : build-in I/F

Schematic Circuit

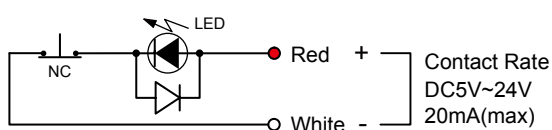


Over Travel Schematic Circuit

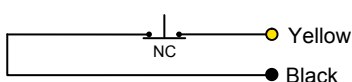


Optional : no build-in I/F

Schematic Circuit



Over Travel Schematic Circuit



Specifications

Item	BTH1220
Repeatability	2 μ m
Pretravel distance	≈ 0
Contact life time	3 Millions
Travel distance	5mm
Contact force	2.0N
Standard cable length	cable 3M/ protect house 2.5M
Over travel dist	≈ 2.5 mm
Protective	IP68

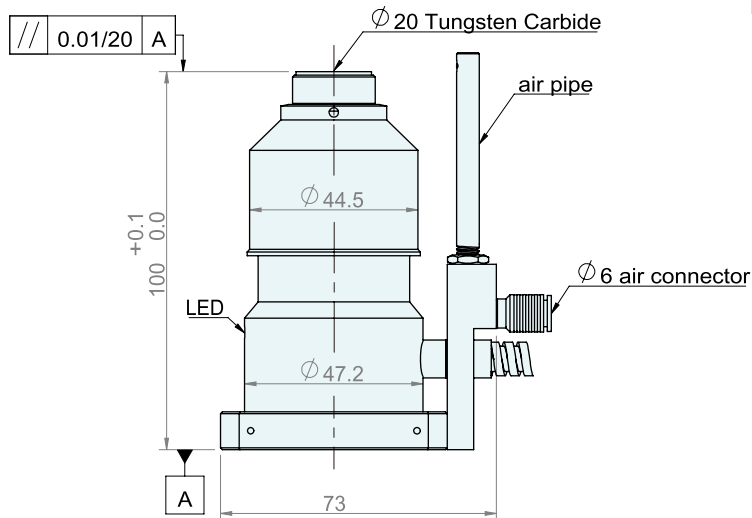
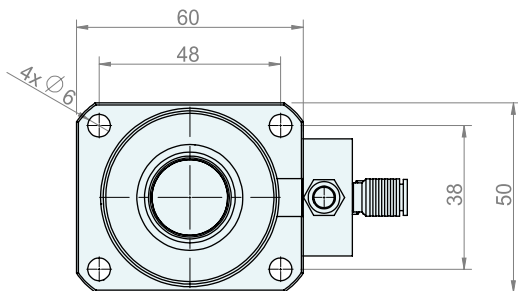
Notice

Power off before installation and uninstallation, in case of damage happened because of a wrong connection.
 AC is not allowed. Be aware of the contact rate is DC 24V max.
 Be aware of the contact rate is 20mA max of no build-in I/F.



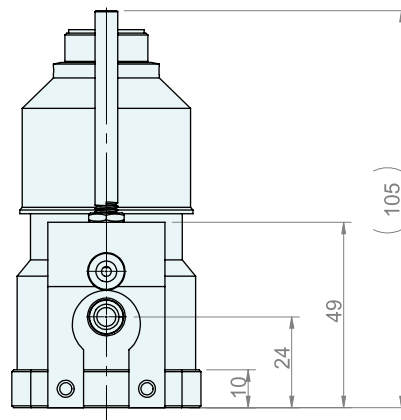
- For CNC Machine
- $\varnothing 20$
- Ball Retainer Inner Core

Dimensions



Specifications

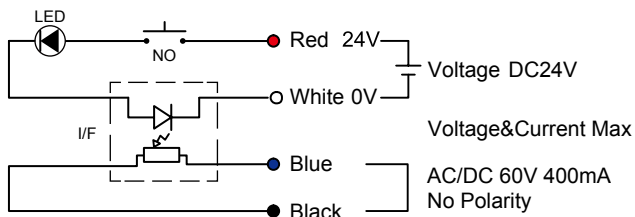
Item	BT20-II
Repeatability	1 μ m
Pretravel distance	\approx 0.5mm
Contact life time	5 Millions
Travel distance	12mm
Contact force	2.5N
Standard cable length	cable 3M/ protect house 2.5M
Over travel dist	\approx 6mm
Protective	IP68



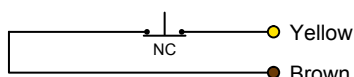
Circuit Configurations

Standard : build-in I/F

Schematic Circuit

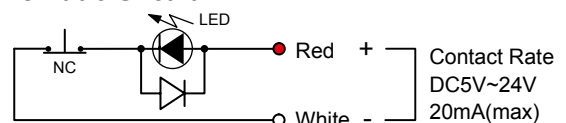


Over Travel Schematic Circuit

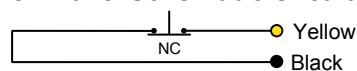


Optional : no build-in I/F

Schematic Circuit



Over Travel Schematic Circuit



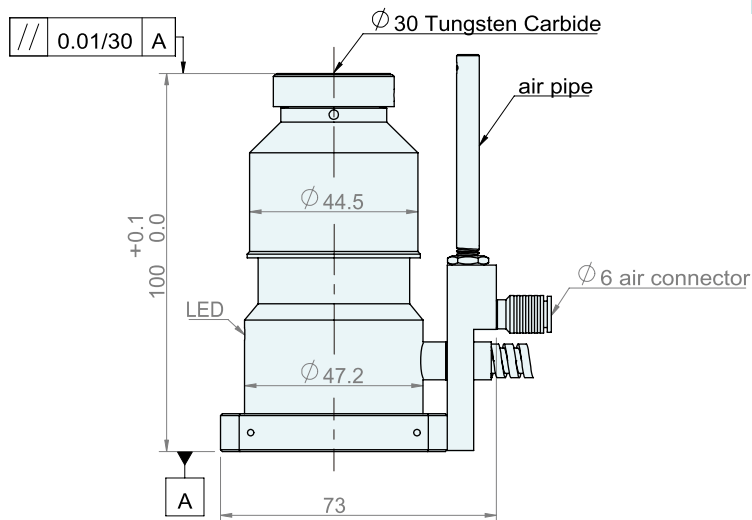
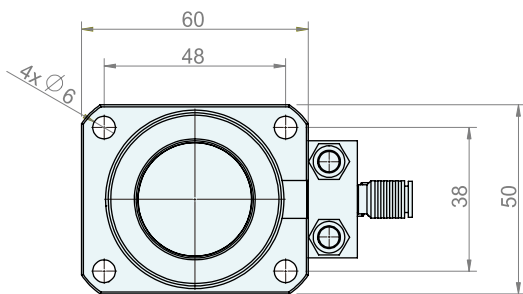
Notice

Power off before installation and uninstallation, in case of damage happened because of a wrong connection.
AC is not allowed. Be aware of the contact rate is DC 24V max.
Be aware of the contact rate is 20mA max of no build-in I/F.



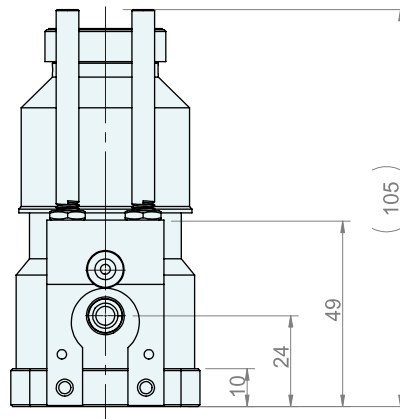
- For CNC Machine
- $\varnothing 30$
- Ball Retainer Inner Core
- Replaceable Head

Dimensions



Specifications

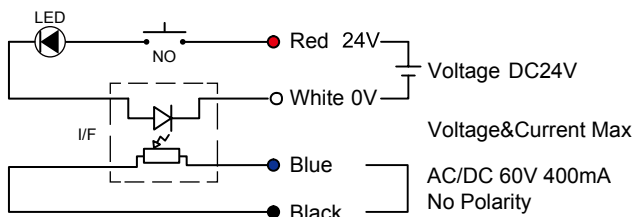
Item	BT2030-II
Repeatability	1 μ m
Pretravel distance	\approx 0.5mm
Contact life time	5 Millions
Travel distance	12mm
Contact force	2.5N
Standard cable length	cable 3M/ protect house 2.5M
Over travel dist	\approx 6mm
Protective	IP68



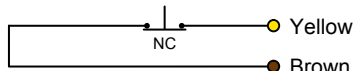
Circuit Configurations

Standard : build-in I/F

Schematic Circuit



Over Travel Schematic Circuit

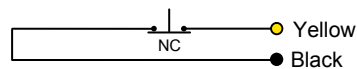


Optional : no build-in I/F

Schematic Circuit



Over Travel Schematic Circuit



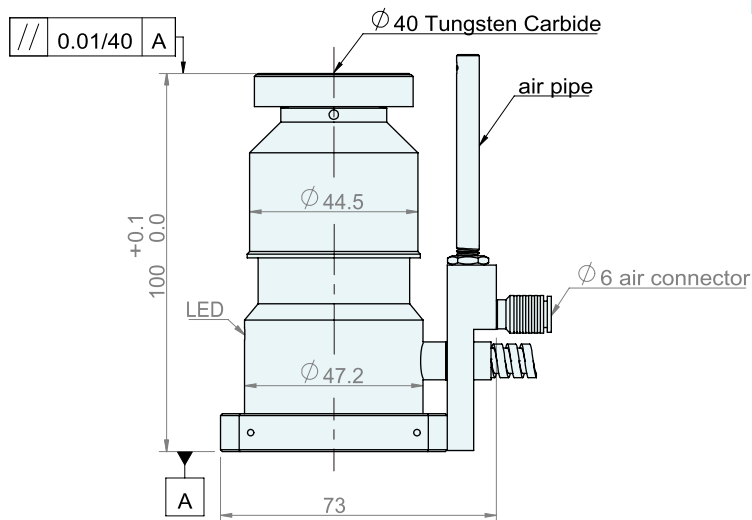
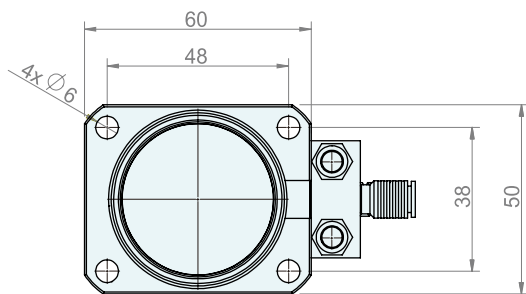
Notice

Power off before installation and uninstallation, in case of damage happened because of a wrong connection.
AC is not allowed. Be aware of the contact rate is DC 24V max.
Be aware of the contact rate is 20mA max of no build-in I/F.



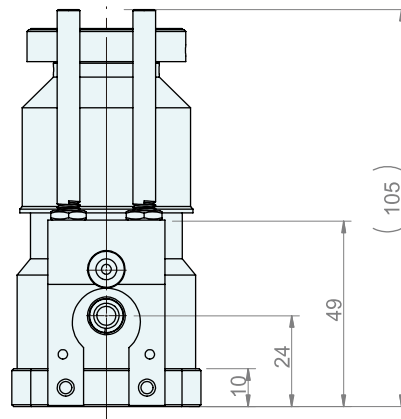
- For CNC Machine
- $\varnothing 40$
- Ball Retainer Inner Core
- Replaceable Head

Dimensions



Specifications

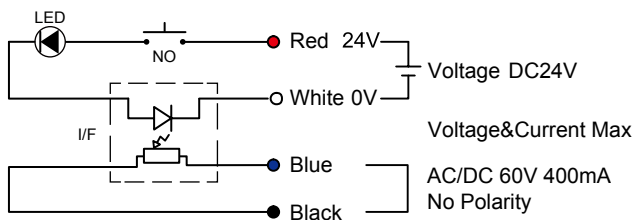
Item	BT2040-II
Repeatability	1 μ m
Pretravel distance	\approx 0.5mm
Contact life time	5 Millions
Travel distance	12mm
Contact force	2.5N
Standard cable length	cable 3M/ protect house 2.5M
Over travel dist	\approx 6mm
Protective	IP68



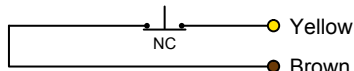
Circuit Configurations

Standard : build-in I/F

Schematic Circuit

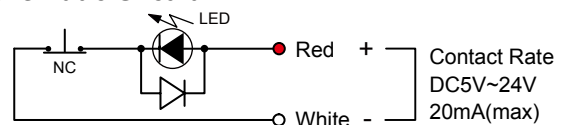


Over Travel Schematic Circuit

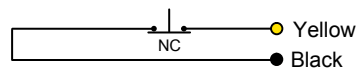


Optional : no build-in I/F

Schematic Circuit



Over Travel Schematic Circuit



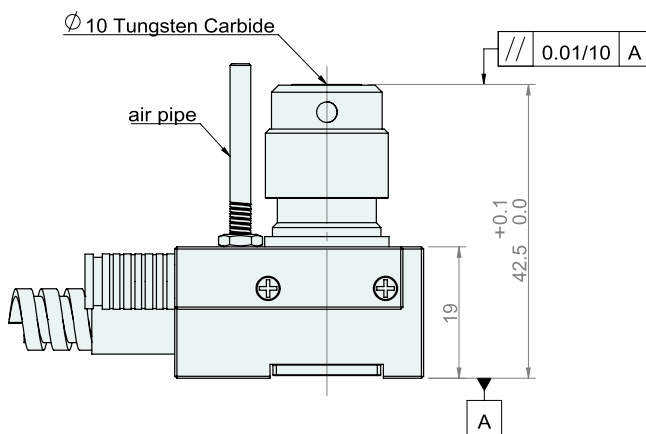
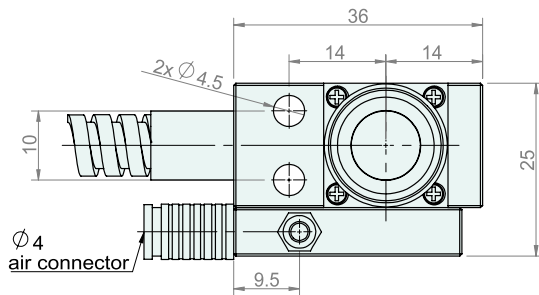
Notice

Power off before installation and uninstallation, in case of damage happened because of a wrong connection.
AC is not allowed. Be aware of the contact rate is DC 24V max.
Be aware of the contact rate is 20mA max of no build-in I/F.



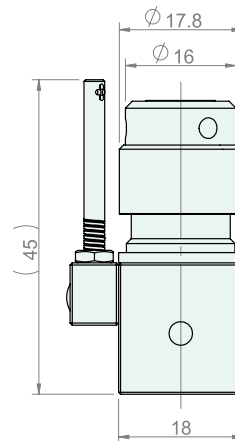
- For Dental Milling Machine/Engraver/CNC Machine
- $\varnothing 10$
- Replaceable Head

Dimensions



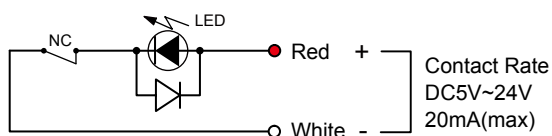
Specifications

Item	BTF1-R
Repeatability	1 μ m
Pretravel distance	≈ 0
Contact life time	2 Millions
Travel distance	4mm
Contact force	2.0N
Standard cable length	cable 3M/ protect house 2.5M
Over travel dist	none
Protective	IP68



Circuit Configurations

Schematic Circuit



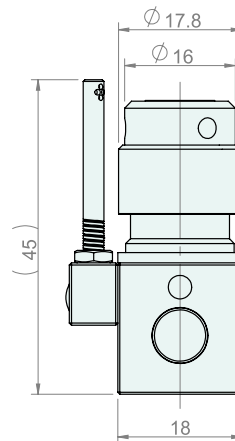
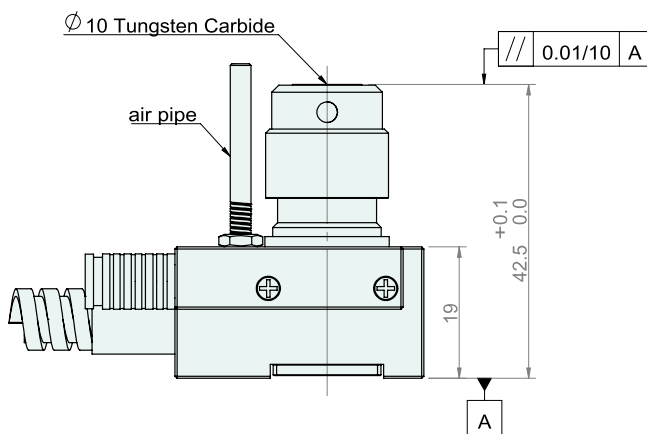
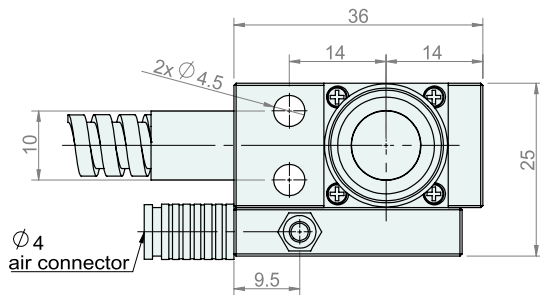
Notice

Power off before installation and uninstallation, in case of damage happened because of a wrong connection.
AC is not allowed. Be aware of the contact rate is (DC 24V ,20mA max)



- For Dental Milling Machine/Engraver/CNC Machine
- $\varnothing 10$
- Replaceable Head

Dimensions

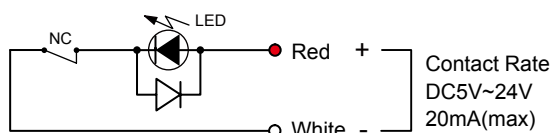


Specifications

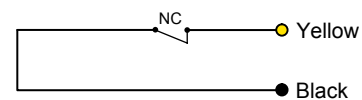
Item	BTF2-R
Repeatability	1 μ m
Pretravel distance	≈ 0
Contact life time	2 Millions
Travel distance	4mm
Contact force	2.0N
Standard cable length	cable 3M/ protect house 2.5M
Over travel dist	≈ 6 mm
Protective	IP68

Circuit Configurations

Schematic Circuit



Over Travel Schematic Circuit



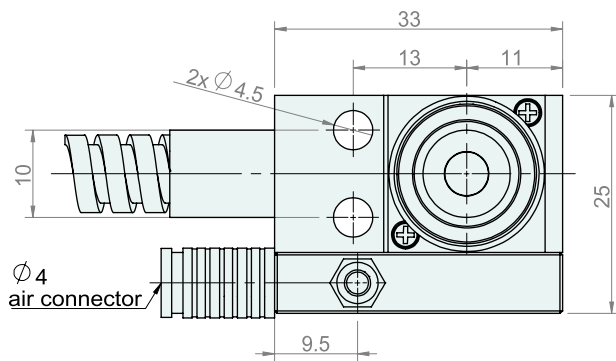
Notice

Power off before installation and uninstallation, in case of damage happened because of a wrong connection.
AC is not allowed. Be aware of the contact rate is (DC 24V ,20mA max)



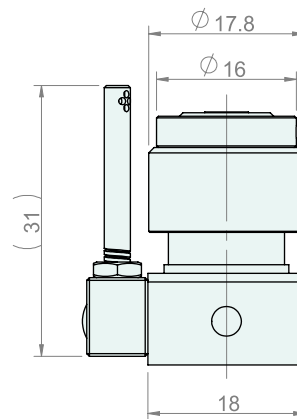
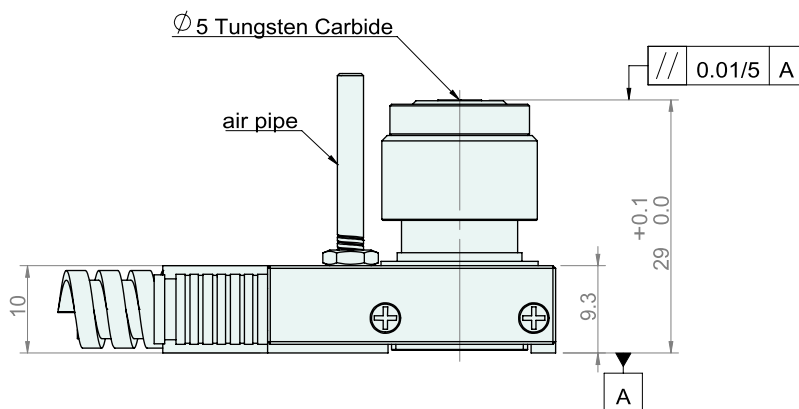
- For Dental Milling Machine/Engraver/CNC Machine
- $\varnothing 5$
- Replaceable Head

Dimensions



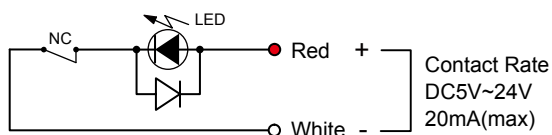
Specifications

Item	BTFC1-R-II
Repeatability	1 μ m
Pretravel distance	≈ 0
Contact life time	2 Millions
Travel distance	2mm
Contact force	0.5N
Standard cable length	cable 3M/ protect house 2.5M
Over travel dist	none
Protective	IP68



Circuit Configurations

Schematic Circuit



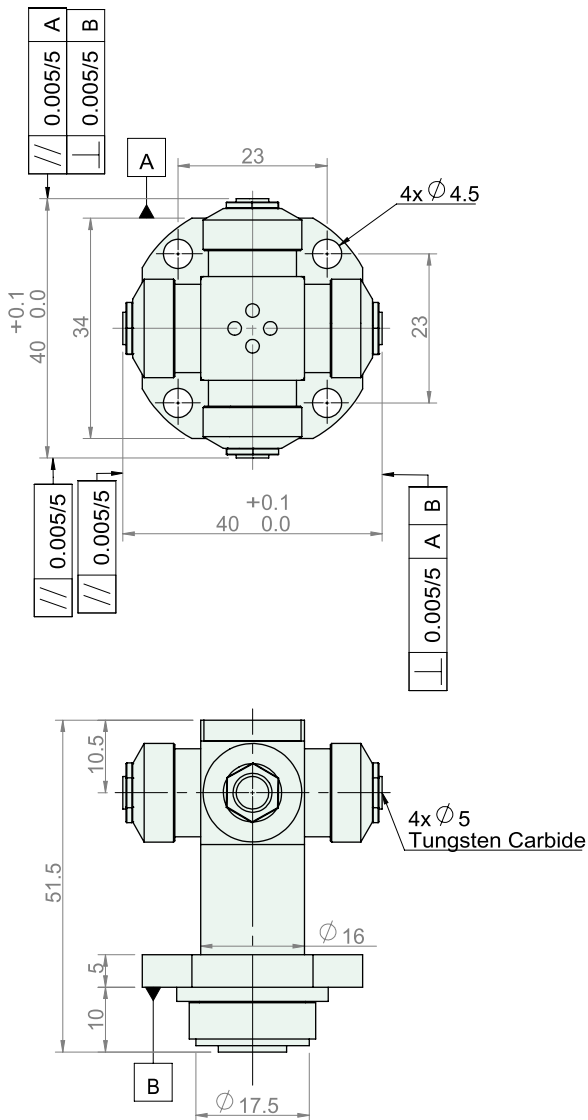
Notice

Power off before installation and uninstallation, in case of damage happened because of a wrong connection.
 AC is not allowed. Be aware of the contact rate is (DC 24V ,20mA max)



- For CNC Lathe Machine
- $\varnothing 5$
- 4 Directions

Dimensions

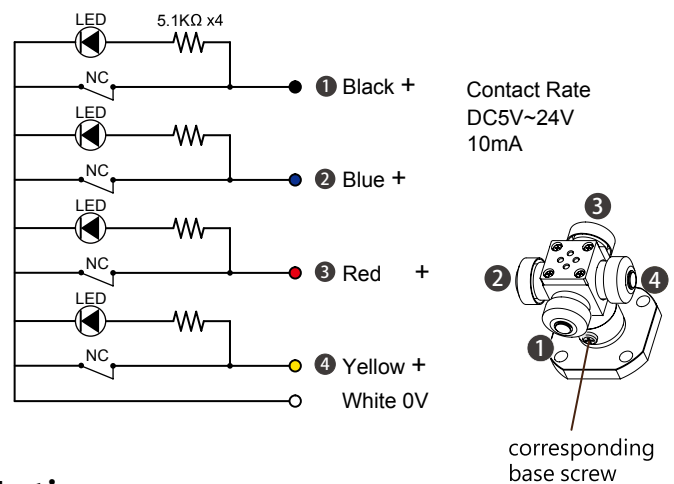


Specifications

Item	B4A
Repeatability	1 μ m
Pretravel distance	≈ 0
Contact life time	2 Millions
Travel distance	1.5mm
Contact force	0.5N
Standard cable length	Cable 5M
Over travel dist	none
Protective	IP68

Circuit Configurations

Schematic Circuit

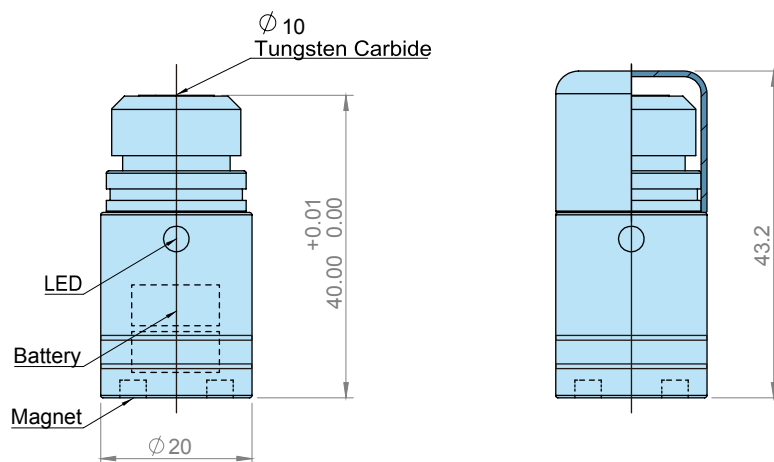


Notice

Power off before installation and uninstallation, in case of damage happened because of a wrong connection.
AC is not allowed. Be aware of the contact rate is (DC 24V ,20mA max)



Dimensions

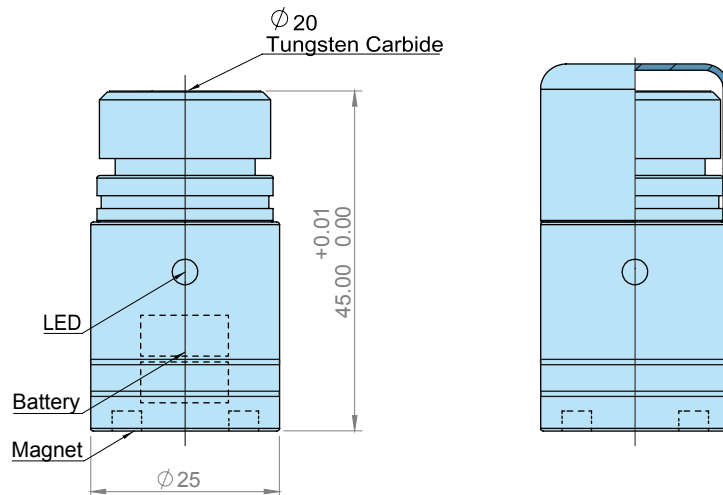


Specifications

Item	BTL20
Repeatability	1 μ m
Travel distance	1.5mm
Contact force	1.5N
Battery	LR44x2
Battery life	9hrs , standby time 90 days
Weight	



Dimensions



Specifications

Item	BTL25
Repeatability	1 μ m
Travel distance	1.5mm
Contact force	1.5N
Battery	LR44x2
Battery life	9hrs , standby time 90 days
Weight	

Model Code

Code	Description	Fit Type
-P	Quick Connector (IP67) Easy to assembly and repair	BT12、BT1220-II、BTH1220 BT20、BT2030、BT2040
-R	Replaceable tungsten head Avoid a whole device being replaced due to the contact surface is broken	BTF1、BTF2、BTFC1
-LX	Length of cable X:Length	All
-HX	Protecting housing X:Length	All except B4A

Sample : BT1220-II-P-L3H2.5

Cable Connector

Normal Connector

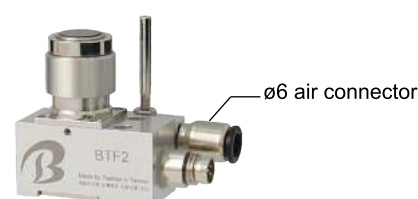


Quick Connector



Air Connector

Fit all air injector equipped devices.
Select by size of air injector.



Ball Retainer Inner Core

Compare with a thrust bearing, a ball bearing equipped tool setter is advantage of high precision, long service life ,low friction and vibration.

Tsense is a company fully experienced in providing high precision ball bearings since 1978. Ball bearing is usually equipped in linear optical scales which resolution is 0.001mm made by Japan or German.

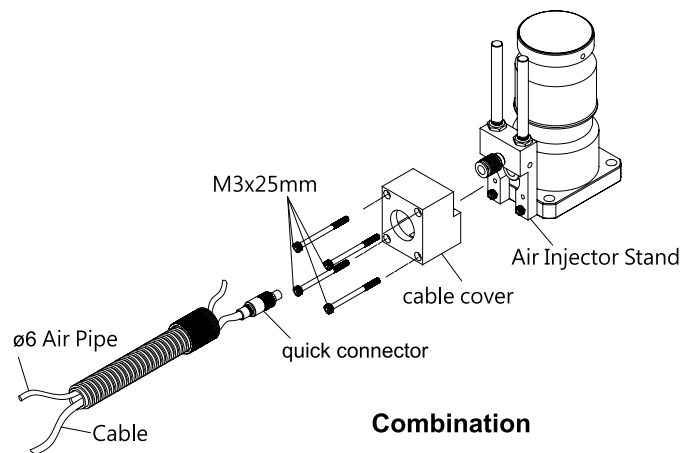


Cable Cover

Fit BT20 Series

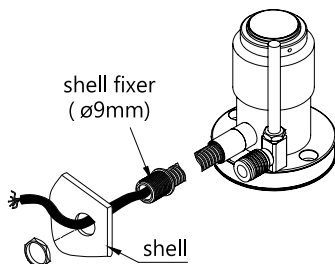
500mm air tube is enclosed.

Length adjustment is available before order confirmed.

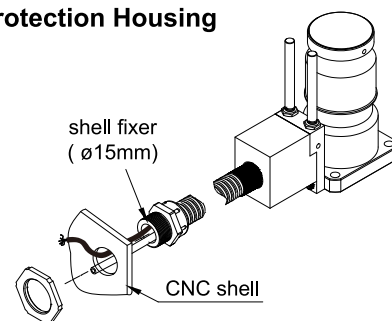


CNC Shell Fixer

Fit 9mm Protection Housing



Fit 15mm Protection Housing



Full Specification



Item	BT12	BT1220-II	BTH1220	BT20	BT20-II	BT2030	BT2030-II
Feature				Ball Retainer Core	Ball Retainer Core	Ball Retainer Core Replaceable head	Ball Retainer Core Replaceable head
Repeatability	2μm	2μm	2μm	1μm	1μm	1μm	1μm
Head Diameter	ø12	ø20	ø20	ø20	ø20	ø30	ø30
Contact material	Tungsten Carbide						
Skip signal : distance from touched to triggered	≒0	≒0	≒0	≒0.5mm	≒0.5mm	≒0.5mm	≒0.5mm
Connect Structure	Normally Open(LED Default Off/Operate On) Normally Closed(LED Default On/Operate Off) -optional						
Recommend Output Rating	DC 12V , 20A or DC24V , 10mA						
Contact Life Time	3 millions	3 millions	3 millions	5 millions	5 millions	5 millions	5 millions
Stroke	5mm	5mm	5mm	12mm	12mm	12mm	12mm
Over Travel Distance	≒ 2.5mm	≒ 2.5mm	≒ 2.5mm	≒ 6mm	≒ 6mm	≒ 6mm	≒ 6mm
Over Travel Contact Structure	NC (Normally Close)						
Contact Force	2.0N	2.0N	2.0N	2.5N	2.5N	2.5N	2.5N
Cable	Oil Resistant, 6 cores						
Standard Cable Length	Cable 3M/ Protect House 2.5M						
Protective Structure	IP68						

Optional



B4AI/F

Output specifications

Output type	PNP-Transistor	
Output method	Open collector	
Output level	24V Source	
Output capacity	DC 24V, 0.2A, 350mA	
Operating Time	Average	0.3 mS
	Maximum	0.5 mS
Features	Protect the contact from overload current Easy to fasten to Din rail bracket	

Electrical specifications

Power Supply Voltage	DC 24V±10%
Current consumption	30mA
Input Port	4 Ports
Output Port	4 Ports
LED Indicator	"Light":NC
	"Dark":NO
Input/Output convert behavior	Inverted output NC→NO ; NO→NC

Mounting method

Mounting method	Din rail adapter
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Dimension 71mm X 68.7mm

Notice

■ B4AI/F is not a waterproof device.

BT2040	BT2040-II	BTF1-R	BTF2-R	BTFC1-R-II	B4A
Ball Retainer Core Replaceable head	Ball Retainer Core Replaceable head	Replaceable head	Replaceable head	Replaceable head	4 Directions
1µm	1µm	1µm	1µm	1µm	1µm
ø40	ø40	ø10	ø10	ø5	ø5 x4
Tungsten Carbide					
≒0.5mm	≒0.5mm	≒0	≒0	≒0	≒0
Normally Closed(LED Default On/Operate Off)					Default Off Operate On
DC 5V~24V , 10mA					
5 millions	5 millions	2 millions	2 millions	2 millions	2 millions
12mm	12mm	4mm	4mm	2mm	1.5mm
≒ 6mm	≒ 6mm	/	≒ 3mm	/	/
			NC		
2.5N	2.5N	2.0N	2.0N	0.5N	0.5N
Cable 3M/ Protect House 2.5M		Oil Resistant, 2 cores	Oil Resistant, 4 cores	Oil Resistant, 2 cores	Oil Resistant, 5 cores
					Cable 5M
IP68					

Notice & Warranty Declare

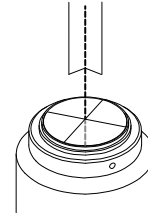
Notice

About Installation

Because there are so many different kinds of CNC machines and controllers, TSENSE as a tool setter manufacturer do not offer customized installation service and customized machine code.
Please contact your CNC machine manufacturer or repair shop if any installation request is needed.

About Contact Method

1. Damage will be caused if the vertical movement exceed the travel distance of a tool setter.
2. Repeatability 0.001mm can be guaranteed while the contact speed is 50~200mm/min (Response of controller <0.5msec)
3. If the diameter of drill is smaller than 0.5mm , please select low force type tool setter. (a customized low force tool setter is available)
4. Minor tilt will happened if the point of contact is at the edge of a larger contact surface. Tilt can be avoided if the central point of tool is aligned to the central point of the contact surface.

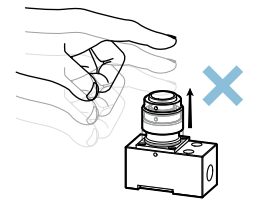
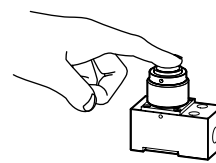


About Cleaning

1. Clean scurf and grease attached on the surface of a tool setter with alcohol.
2. Edge of cover need to be cleaned in case of scurf block the movement of a tool setter.

About Hand Press

Avoid bouncing after pressing, otherwise it will cause damage to a tool setter.



About Electrical Circuit

1. Positive and negative electrode must be noticed in case of damaging the LED inside a tool setter.
2. 10mA load resistance is recommended.
3. Contact Rate DC 24V±10% Max 20mA

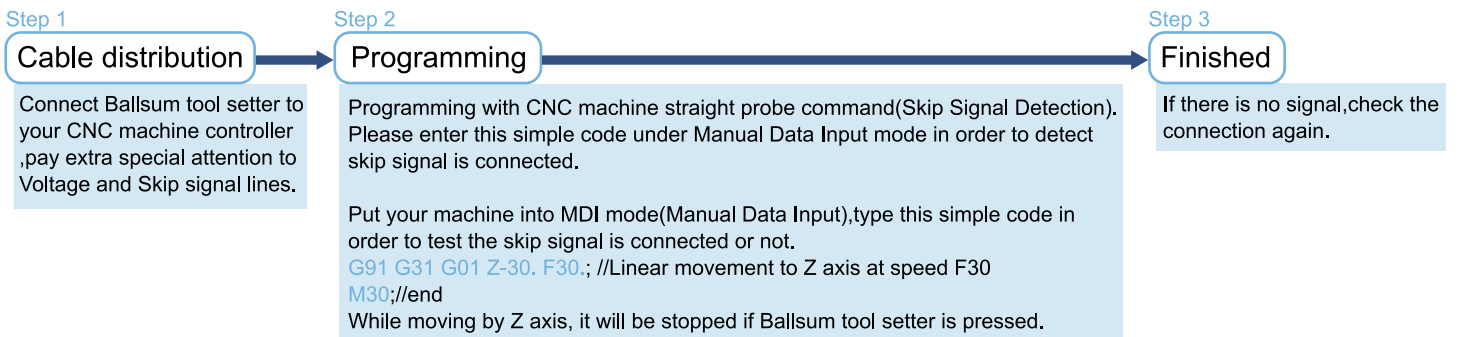
Warranty declare

About Warranty

1. Warranty period is 12 months after the date of installation.
2. Once a tool setter is still valid in warranty, labor cost of maintenance is free but material expense will be charged.
3. Any loss caused by a damaged tool setter is not under warranty.
4. Any hardware cracking, modification is at your own risk , it will void warranty.

How to install tool setters?

Controller installation



Malfunction Detection

Exam the resistance between Red and White wire with a multimeter

- It is good if the resistance is one of "0 to ∞" or "∞ to 0" while your Ballsum tool setter is triggered.

Mold Counters

FOR your INJECTION MOLDS

monitor the usage of your mold
gaurantee your right in a contract production



- Germany , Taiwan and China Patented
- Highest temperature endurable 160°C/320°F
- 7 digits and 6 digits square and round shapes for different usage of molds
- Series number and tamper sticker for each counter

Taiwan Patent #M381961

China Patent #201020148872.X

Germany Patent #202011001185.2

Tsense Products Brief Introduction

Guide Sets

FOR your PRESS MOLDS

gaurantee your mold working in high precision and high speed

- 35 years OEM experience since 1978
- ISO 9001 certified
- $\pm 0.25\mu\text{m}$ tolerance for each balls
- $\pm 0.5\mu\text{m}$ tolerance control ability for guide post and bushes
- Customized and small quantity production available



