BL AUTOTEC

BL QUICK-CHANGE™

Automatic End-Effector Exchange System

www.bl-autotec.co.jp

BANDO BANDO GROUP

BL AUTOTEC, LTD.

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3-17, Meiwa-dori, 3-chome, Hyogo-ku, Kobe, 652-0883, Japan
TEL +81-78-682-2612 FAX +81-78-682-2614
E-mail : info@bl-autotec.co.jp

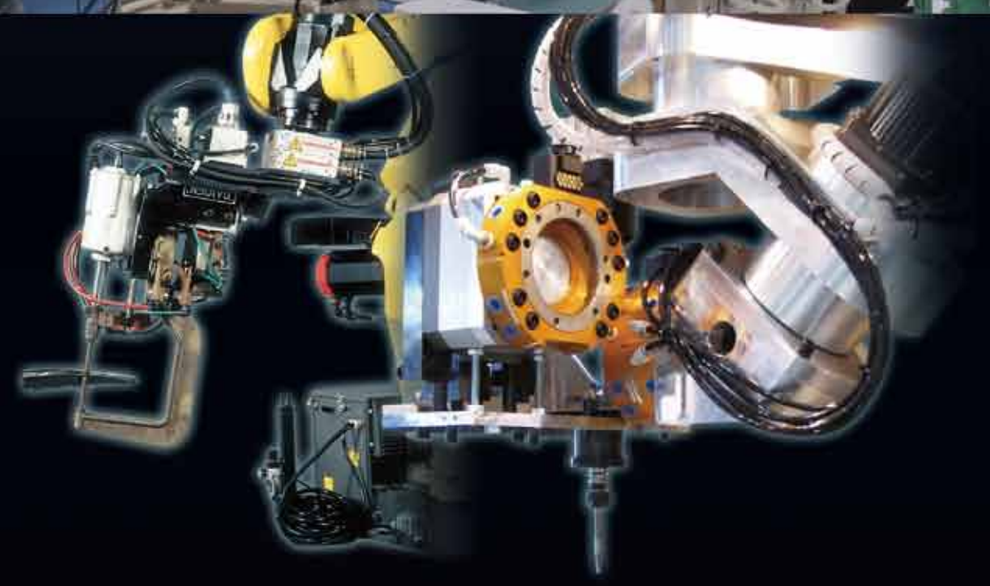
■For orders, contact the following distributor:

BL-QC-E036 (41)

BL AUTOTEC offers production line solutions that exceed expectations based on our abundant experience in the factory automation field.

With a proven track record, and as a pioneer maker of automatic tool changers, BL Autotec has been responding to customer needs and proposing solutions in this field since 1987. We offer optimum solutions to accommodate individual customer requirements, and deliver original products that exceed expectations.

QUICK-CHANGE™



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BL QUICK-CHANGE

Increased Productivity and Cost Effectiveness Enhanced Robot Flexibility

The **BL QUICK-CHANGE** is a device for automatic tool changing,
designed to enable robots and automated equipment to
automatically change end-effectors or other peripheral tooling
With the quick and reliable tool changing provided by the **BL QUICK-CHANGE**,
a single robot can perform a variety of tasks and reduce setup time,
thus increasing actual production line efficiency and cost effectiveness.

The **BL QUICK-CHANGE** can be used under maximum load capacity,
maintaining the positional repeatability specified in each model,
thanks to the built-in safety in its design.

Fast, Durable, Accurate – Reliable

■Feature

Superior Fall-safe Locking Mechanism

The balls on the Master plate pneumatically lock into the Tool plate locking ring, They remain locked even if pneumatic pressure is accidentally shut off , ensuring that tools are not dropped under almost any conditions.

Excellent Positional Repeatability

The Master and Tool plates lock in the same position, even after one million operating cycles.
(In accordance with JIS B 8432, Industrial Robotics Standards, Function Measurement Method.)

Moment Resistance Rigidity

The ball-locking mechanism enables the plates to withstand 2G of acceleration under ordinary operation and 5G when the robot stops in an emergency.

Large Misalignment Correction Capability

The unique design allows coupling of the Master and Tool plates, even if plates are misaligned, and allows for the plates to lock together with a gap between them.

■Description

Master plate

Master plate is installed on the robot end-of-arm and couples/uncouples with the Tool plate.
The Master plate includes a pneumatically-driven ball-locking mechanism. Its pneumatic ports and electrical contacts pass air and signals to the Tool plate and end-effector. (Note)

Tool plate

Tool plate is attached to each end-effector.
Its pneumatic port and electrical contacts receive air and signals from the Master plate and robot. The number of Tool plates and end-effector is the same, as one Tool plate is attached to each-effector. (Note)

(Note) On some models, pneumatic ports and electrical contacts are optional.

■Applications

- Assembly
- Material Handling
- Palletizing
- Deburring
- Polishing
- Material Handling Welding
- Spot-welding Gun Exchange

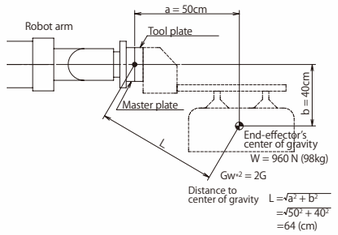
BL Quick-Change Model Selection

Selection by Moment

- Make sure to select a model within the specified tooling payload capacity and allowable static moment.
- Allowable static moment is the moment applied to the Quick-Change in the bending. (TX, Ty) and twisting (Tz) directions when the robot is not moving. Whatever position the robot is in, the specified maximum allowable moment must not be exceed.
- If the static moments in both the bending and twisting directions are applied to the Quick-Change at the same time, each must not exceed their allowable moment, and their combined moments (※1) must not exceed the higher of the two moments.
- The allowable static moment shown in this catalogue is assuming up to 2G of acceleration, including acceleration at the end-effector's center-of-gravity, when the robot is in operation, and up to 5G when the robot stops in an emergency.

Allowable dynamic moment is twice the allowable static moment in both the bending and twisting directions under ordinary operation.

Calculation Example (Model : Flex-100B)



TOP VIEW

Allowable Static Moment for Each Model

Model	Load capacity	Allowable Static Moment(Nm)※1	
		Twisting Direction	Bending Direction
QC-1	9.8N(1kg)	4	16.6
Light-5A	49N(5kg)	25.4	33.2
QC-10B	98N(10kg)	49	68.6
QC-20D	196N(20kg)	113.6	156.8
Flex-40B	392N(40kg)	314	430
QC-60D	588N(60kg)	392	588
Flex-70A	686N(70kg)	686	784
Flex-100B	980N(100kg)	1372	1372
QCP-100A	980N(100kg)	1372	1372
USP-100A	980N(100kg)	980	980
QC-150C	1,470N(150kg)	1960	1960
QCP-220	2,156N(220kg)	3332	3332
Flex-300A	2,940N(300kg)	5292	4704
GC-300A	2,940N(300kg)	5292	4704
ZEUS	2,254N(230kg)	3332	3332
GIGA	6,860N(700kg)	7840	5880

Remarks

- In the graph at left, the allowable static moment is within the enclosed area from the zero point to the curved line for each model.
- When the end-effector or the payload rotates, the load applied to the Quick-Change by intertia moment must also be considered. If the distance between the Quick-Change and the end-effector's center-of-gravity is far, for example, in press handing applications, please contact BL. Autotec, Ltd.
- If locating pins are not used, moment characteristics may not be obtainable.

Flex-100B Specifications

Load capacity		980N (100kg)
Dynamic static moment (when coupled)	Bending direction	1,372N·m(140kgf·m)
	Twisting direction	1.372N·m(140kgf·m)

■Weight of end-effector and payload

W=960N (98kgf) ≦980N (100kgf)

■Dynamic moment ※2

Bending direction $M_B = W \times a \times Gw$ ※2 $= 960 \times 0.50 \times 2 = 960\ N \cdot m \leqq 1372\ N \cdot m$

Twisting direction $M_T = W \times b \times Gw$ ※2 $= 960 \times 0.40 \times 2 = 768\ N \cdot m \leqq 1372\ N \cdot m$

Combined ※3 $M_C = \sqrt{M_B^2 + M_T^2} = \sqrt{960^2 + 768^2}$

$= 1230\ N \cdot m \leqq 1372\ N \cdot m$

■Decision for use

This calculation indicates that the Flex-100B may be selected.

※1 Allowable dynamic moments are the stated values when pneumatic pressure is 0.49Mpa.
※2 Maximum acceleration including gravitational acceleration when the robot is in operation.
※3 Absolute values of vectors of composition in bending and twisting directional moments must not exceed the larger value of allowable dynamic moment of either bending or twisting direction.

QUICK-CHANGE ZEUS™ for Next-Generation Robots

QUICK-CHANGE ZEUS™

QUICK-CHANGE ZEUS™ is available such as spot-welding gun exchange, material handling and tool changing. It can use for robot payloads of 150-230kg. ZEUS incorporates the proven locking mechanism of the BL Quick-Change. It is a new, advanced Quick-Change, and ZEUS is light weight and thinness when coupled.

Compact, Light, Thin!
The weight has been reduced by 50% and the outer dimension is 70% compared with our Servo Gun Changer for 220kg payloads. It is only 110mm thick when coupled, which minimizes stress on the robot. The round shape reduces interference by the wiring and hose on the robot arm.

Enhanced mechanical fail-safe function!
Our proven mechanical fail-safe mechanism has been further enhanced with the addition of a spring back-up for greater reliability, so the Master and Tool Plates will not separate, even if pneumatic pressure fails.

Conforms to ISO standards for robot flanges!
The bolt patterns on ZEUS match the ISO 9409 "mechanical interface" for pitches of ϕ125mm and ϕ160mm. It can be installed on almost all industrial robots with 150-230 kg capacity. We can custom-manufacture to suit other robot flanges.

Standard equipped lock/unlock sensor & LED indication!
A lock/unlock sensor and LED indications for "lock" or "unlock" are standard equipped on ZEUS, and an approach sensor (with LED indication) useful for teaching is available as an option.

Resolves communication errors!
Resolves servo signal communication errors with a plug-in module.

Various options available!
Options, such as fool-proof valves for drop prevention in predefined positions, solenoid valves and field bus systems are available. Please contact us for details.

Master plate
(ZEUS-M1N-SEAM-FL6BM-WPCM-IS-AS-XN)

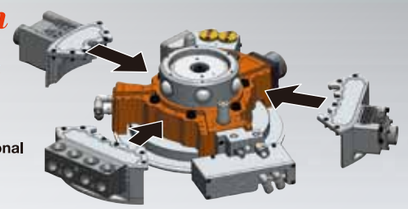
Tool plate
(ZEUS-T-SEAT-FL6BT-WPCT-X)

Specifications

Main body			
Weight capacity(Rated load)		1,470~2,254N(150~230kg)	
Positioning repeatability		±0.025mm	
Allowable dynamic moment	Bending direction(Tx,Ty)	3,332N・m(340kgf・m)	
	Torsional direction(Tz)	3,332N・m(340kgf・m)	
Coupling force(at 0.49MPa air pressure) ※1		27,444N(2,800kgf)	
Material	Frame	Aluminum alloy	
	Lock/unlock mechanism	stainless steel	
Outer dimension (When coupled)		φ226×H110 ㎜	
Product weight (Main body)	Master Plate	5.4kg	
	Tool Plate	2.3kg	
Electric signal connection(Built-in)	Connector(Master side)	5A×20 ※2	D/MS3102A24-28P
	Connector(Tool side)		D/MS3102A24-28S
Lock/unlock mechanism		Ball-locking mechanism	
Lock/unlock operation required air pressure		0.39～0.68MPa(4～7kgf/cm²)	
Allowable temperature and humidity range		0～50℃, 35～90%(Non-condensing)	
Lock/unlock sensor	Lock status	1 built-in proximity switch	
	Unlock status	1 built-in proximity switch	
Insulation plate set	Model	With/without insulation plate	
	IS	Insulation plate (Fiber-reinforced Bakelite)	
	IN	Without insulation plate	

Over 1 million combinations available to meet your needs with flexible options!

May be used wiht conventional Quick Change modules.



Drop-prevention valve [Mechanical fool-proof system]

Optional safety system In case of lock/unlock solenoid valve malfunction. The Tool plate will not release from the Master plate except when it is located above the tool stand.

Lock/unlock Solenoid valve

A lock/unlock solenoid valve attached to the Master plate is available as an option.

Accessories for master plate (in case of Master plate is IN02) ※Select necessaryplates and options based on an application or a robot flange.

In case of type of Master plate is M1(PCD125) (M1)...Stepped Parallel Pin(φ10×25)×2pcs, Hexagon socket bolt(custom) (M10×65)×6pcsWasher(φ14)×6pcs
In case of type of Master plate is M2(PCD160) (M2)...Stepped Parallel Pin(φ10×25)×2pcs, Hexagon socket bolt(custom) (M10×50)×6pcsHexagon socket bolt(custom) (M10×20)×6pcs, Washer(φ14)×12pcs,
(M3)...Stepped Parallel Pin(φ10×25)×2pcs, Hexagon socket bolt(custom) (M10×50)×6pcsHexagon socket bolt(custom) (M10×20)×6pcs, Washer(φ14)×6pcs,
Washer(for M12)×6pcs

(※1)Coupling force means force which assure repeatability, coupling of Quick changeis kept until supplying air for uncoupling or destroyed by crush. (※2)Max.93.6A is allowed as connector

Option

■Module for A side and B side

	Model	Capacity and number of contacts	Connector for Master Plate side	Connector for Tool Plate side
Servo module	SEAM(T) SEBM(T)	Servo powers 20A(500V)×6 ※1	D/MS3102A20-17P	D/MS3102A20-17S
		Electric signals 5A(220V)×17 ※2	D/MS3102A20-29P	D/MS3102A20-29S
	SEYAM(T) SEYBM(T)	Servo powers 20A(500V)×6 ※5	D/MS3102A20-15P	D/MS3102A20-15S
		Electric signals 5A(220V)×17 ※2	D/MS3102A20-29P	D/MS3102A20-29S
	SEPAM(T) SEPBM(T)	Servo powers 20A(500V)×6 ※1	D/MS3102A20-17P	D/MS3102A20-17S
		Electric signals 5A(220V)×17 ※2	D/MS3102A20-29P	D/MS3102A20-29S
		Electric signals 5A(220V)×37 ※6	D/MS3102A28-21P	D/MS3102A28-21S
Fluid module ※3	FL4AM/FL4BM	4 ports	Master Plate side	4 ports Rc3/8(self-sealing) for both of coolant and pneumatic
	FL4AT/FL4BT		Tool Plate side	
	FP4AT/FP4BT		Tool Plate side	4 ports Rc3/8(pass-through)for pneumatic
	FL6AM/FL6BM	6 ports	Master Plate side	6 ports Rc3/8(self-sealing)for both of coolant and pneumatic
	FL6AT/FL6BT		Tool Plate side	
	FP6AT/FP6BT		Tool Plate side	Rc3/8×6(pass-through)
Pneumatic port	P38AM(T)*	4 ports		Rc3/8×4(pass-through)
Electric signal module	JXAM(T)* JXBM(T)*	5A×16 ※7	JMR-2116M-D	JMR-2116F-D
	RXAT* RXBT*	5A×16(without connector)※9		terminal for solder
	MWXAM(T) MWXBM(T)	13A×10 Resistance to dust and wator	D/MS3102A18-1P	D/MS3102A18-1S
	BNXAM(BDXAT)* BNXBM(BDXBT)*	non-contact electric signal 15 NPN output	WEBR2119MS-D	WEBR2116FS-D
	BPXAM(BDXAT)* BPXBM(BDXBT)*	non-contact electric signal 15 PNP output	WEBR2119MS-D	WEBR2116FS-D
Ground contact module	E51AM(T)* E51BM(T)*	500A×1(usage：50%)		
Attachment module	GLAM(T) GLBM(T)	Attachment module for A or B side. (For adding conventional Quick change options)		
Cover	LCAM(T) LCBM(T)	Cover for A side or B side (always use cover when the modules are not in use)		

■Module for C-side

	Model	Capacity and number of contacts	Connector for Master Plate side	Connector for Tool Plate side
Primary current module	WPCM(T)	200A(usage: 25%)600V Sequence 100A(600V)×3 ※4 Thermo signal: 5A(200V)×3	D/MS3102A36-3P	D/MS3102A36-3S
	WSCM(T)		Seal connector ABS-3632	
Pneumatic port	P18CM(T)*	4 ports	Rc1/8×4(pass-through)	
	P3WCM(T)*	2 ports	Rc3/8×2(pass-through)	
Electric signal module	JCM(T)*	5A×16 ※7	JMR-2116M-D	JMR-2116F-D
	RCT*	5A×16 (without connector) ※9		terminal for solder
	MCM(T)*	13A×10 ※8	D/MS3102A18-1P	D/MS3102A18-1S
	MWCM(T)	13A×10 Resistance to dust and wator	D/MS3102A18-1P	D/MS3102A18-1S
	BNCM(BDCT)*	non-contact electric signal 15 NPN output	WEBR2119MS-D	WEBR2116FS-D
	BPCM(BDCT)*	non-contact electric signal 15 NPN output	WEBR2119MS-D	WEBR2116FS-D
Ground contact module	E51CM(T)*	500A×1(usage：50%)		
Attachment module	GSCM(T)	Attachment module for C-side (For fitting conventional Quick change options onto C-side)		
Cover	SCCM(T)	Cover for C side(always use cover when the modules are not in use)		

*include attachment module

■Miscellaneous accessories

Approach sensor	AS	With approach sensors : 2 Proximity switches for sensing tool plate(AC 2 cords)
	AN	Without approach sensor
Drop-prevention valve (Fool proof) Lock/unlock Solenoid valve	VE	V : With valve for prevent releasing tool plate (In case malfunction of solenoid valve for lock/unlock or operation mistake, tool plate is never released places except tool stand.
	VN	X : Without valve for prevent releasing tool plate
	XE	E : With solenoid valve for lock/unlock
	XN	N : Without solenoid valve for lock/umlock

*include attachment module
(※1)Allowable current is Max.20A for pin(13A for pin No.F) and total allowable current is 71.6A for connector. (※2)Allowable current is total 81.7A for connector. (※3)Port with self-sealing of Fluid module cannot be used for vacuum. (※4)Allowable current is total 290.6A for connector. (※5)Allowable current is total 83.7A for connector. Connector has 7 pins. (※6)Allowable current is total 120.2A for connector. (※7)Allowable current is total 30.4A for connector. (※8)Allowable current is total 57.2A for connector. (※9)Type of connector for master side is JMA.

In case of order options as part, model might be different from the above table. Please ask to our company's staff.

Ordering Information

Master plate

ZEUS –M1N– / –M2N– / –M3N– / –M1P– / –M2P– / –M3P– – Module for A-side □□□AM – Module for B-side □□□BM – Module for C-side □□□CM – Insulation plate (Adaptor plate with boss) □□□□ – Approach sensor □□ – Drop-prevention valve Lock/unlock Solenoid valve □□

→ PCD mounting robot (type of sensors PNP or NPN (for lock/unlock and approach))
M1=PCD125mm,M10
M2=PCD160mm,M10
M3=PCD160mm,M12
N =Sensor output NPN
P =Sensor output PNP

Insulation plate (Adaptor plate with boss) (Master Plate side only)

IS	With insulation plate
IN02	Without insulation plate, knock pin x 2
IN50	Without insulation plate, inlay φ50 n7
IN63	Without insulation plate, inlay φ63 n7
IN80	Without insulation plate, inlay φ80 n7
IN10	Without insulation plate, inlay φ100 n7
INAB	For ABB robot (Boss φ100) n7

→ When selecting M3, Only INAB is available and IS is also excluded from option. When selecting M1 or M2, INAB is unavailable.

Approach sensor (Master Plate side only)

AS	With approach sensor
AN	Without approach sensor

Drop-prevention valve Lock/unlock Solenoid valve

VE	With valve for prevent releasing tool plate With solenoid valve for lock/unlock ※
VN	With valve Without solenoid valve
XE	Without valve With solenoid valve ※
XN	Without valve Without solenoid valve

※When you add solenoid valve, usable electric singnal(Built-in) are limited upto 18.

Tool plate

ZEUS –T– Module for A-side □□□AT – Module for B-side □□□BT – Module for C-side □□□CT – Drop-prevention valve □

【Servo module】

SE	Servo power 20A×6 ※1 Electric signal 5A×17 ※2
SEY	Servo power 20A×6 ※1 Electric signal 5A×17 ※2 Connector for motor has 7pins
SEP	Servo power 20A×6 ※1 Electric signal 5A×17 ※2 Electric signal 5A×37 ※6 37prove contacts is added in serve module
LC	Covers for A and B (always use the over when the modules are not in use

【Fluid module】

FL4	4 cooling water ports or pneumatic port
FP4	4 pneumatic ports for Tool Plate
FL6	6 cooling water ports or pneumatic port
FP6	6 pneumatic ports for Tool Plate
LC	Covers for A and B (always use the over when the modules are not in use

【Pneumatic port】

P38	Pneumatic Rc3/8×4
LC	Covers for A and B (always use the over when the modules are not in use

【Electric signal module】

J	J16A module 5A×16
R	5A×16 for Tool Plate
MW	13A×10Resistance to dust and wator
BN	non-contact electric signal15 NPN output for Master Plate
BP	non-contact electric signal15 PNP output for Master Plate
BD	non-contact electric signal 15 Sensor input for Tool Plate
LC	Covers for A and B (always use the over when the modules are not in use

【Other】

E51	500A×1
GL	Attachment module
LC	Covers for A and B (always use the over when the modules are not in use

【Primary current module】

WP	200A(usage: 25%) 600V Sequence 100A(600V)×3 ※4 Thermo signal: 5A(200V)×3 (WP : receptacle type WS : seal connector type)
WS	
SC	Cover for C side (always use the cover when the modules are not in use

【Pneumatic port】

P18	Pneumatic Rc1/8×4
P3W	Pneumatic Rc3/8×2
SC	Cover for C side (always use the cover when the modules are not in use

【Electric signal module】

J	J16A module 5A×16
R	5A×16(without connector) for Tool Plate
M	13A×10(insertion contact)
MW	13A×10 Resistance to dust and wator
BN	non-contact electric signal15 NPN output (available for master plate only)
BP	non-contact electric signal15 PNP output (available for master plate only)
BD	non-contact electric signal15 Sensor input (available for tool plate only)
SC	Cover for C side (always use the cover when the modules are not in use

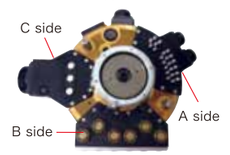
【Other】

E51	500A×1
GS	Attachment module
SC	Cover for C side (always use the cover when the modules are not in use

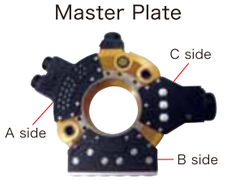
Drop-prevention valve

V	With valve prevent releasing tool plate
X	Without valve for prevent releasing tool plate

Installing position



Master Plate



Tool Plate

Please contact BL Autotec, Ltd. for detailed information on the options.

・The electric connector and plugs are user-provided. ・Please contact BL Autotec, Ltd. for detailed information on the modules.
・Please contact BL Autotec, Ltd. for special conditions and specific applications. ・Please refer to the Installation & Maintenance Manual when using.
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The configuration and specifications for this series are subject to change.

New-Generation Heavy Payload QUICK-CHANGE

QUICK-CHANGE GIGA™

GIGA is a device for automatic tool changing, designed for robots handling heavy-payloads, with weight capacities of 350kg, 400kg, 500kg, and 700kg. GIGA is used for body in white handling and jig base changing in the automotive industry. It is also used in other industries for heavy load palletizing, and loading and unloading of CNC machines. In addition to handling applications, GIGA can be used in spot-welding gun changing applications. GIGA can also use our QUICK-CHANGE ZEUS Series modules.

Master plate
(GIGA-MN-SEAM-FL6BM-WPCM-SCDM-VE)

Tool plate
(GIGA-T-SEAT-FL6BT-WPCT-SCDT-V)

Lock without touching

The Master plate can lock onto the Tool plate with a gap between them

Enhanced mechanical fail-safe function!

Our proven mechanical fail-safe mechanism has been further enhanced with the addition of a spring back-up for greater reliability, so the Master and Tool Plates will not separate, even if pneumatic pressure fails.

Conforms to ISO standards for robot flanges!

The GIGA bolt pattern is compatible with heavy payload robot flanges.
Bolt pattern: PCD 200, M12×6 pcs

Safety feature : fool-proof

Built-in lock/unlock sensor (selection NPN/PNP)
Built-in approach sensor (detecting clearance of Tool Plate)
Standardly equipped mechanical safety valve that allows Tool Plate to separate from Master Plate only at a certain spot on tool stand.

Specifications

Main body

Load capacity (Rated load)		6,860N(700kg)
Positional repeatability		±0.025mm
Allowable dynamic moment	Bending direction (Tx.Ty)	7,840N·m(800kgf·m)
	Twisting direction (Tz)	5,880N·m(600kgf·m)
Coupling force (at 0.49MPa air pressure) ※a		63,239N(6,453kgf)
Material	Frame	Aluminum alloy
	Lock/unlock mechanism	stainless steel
Overall dimension (When coupled)		ϕ350×H160mm
Product weight (Main body)	Master Plate	25kg
	Tool Plate	15kg

Electric signal connection (Built-in)	Connector(Master side)	5A×20 ※b	D/MS3102A24-28P
	Connector(Tool side)		D/MS3102A24-28S
Lock/unlock mechanism		Ball-locking mechanism	
Lock/unlock operation required air pressure		0.39~0.68MPa(4~7kgf/cm²)	
Allowable temperature and humidity range		0~50°C、35~90% (Non-condensing)	
Lock/unlock sensor	Lock status	1 built-in proximity switch	
	Unlock status	1 built-in proximity switch	
Drop prevention valve		Mechanical Valve	

Accessories for master plate

W/O insulation (IN12 or IN16)…parallel pin (ϕ12×22)×1pc, bolts (M12×90)×6pcs, flat washers (for M12 bolts, small)×6pcs, spring washers (for M12 bolts)×6pcs, resin collars (inner ϕ12.5)×6pcs
With insulation (IS)…insulation locating pins (ϕ12×30)×2pcs, bolts (M12×100)×6pcs, flat washers (for M12 bolts, small)×6pcs, spring washers (for M12 bolts)×6pcs, resin collars (inner ϕ12.5), insulation plate×1pc

(※a)Coupling force is the force to achieve specified repeatability.Coupling will be maintained until unlock pressure is applied or the device is damaged.
(※b)Max.93.6A is allowed as connector.

Option

■Module for A side and B side

	Model	Capacity and number of contacts		Connector for Master Plate side	Connector for Tool Plate side
Servo module	SEAM(T) SEBM(T)	Servo powers 20A(500V)×6 ※1		D/MS3102A20-17P	D/MS3102A20-17S
		Electric signals 5A(220V)×17 ※2		D/MS3102A20-29P	D/MS3102A20-29S
	SEYAM(T) SEYBM(T)	Servo powers 20A(500V)×6 ※5		D/MS3102A20-15P	D/MS3102A20-15S
		Electric signals 5A(220V)×17 ※2		D/MS3102A20-29P	D/MS3102A20-29S
	SEPAM(T) SEPBM(T)	Servo powers 20A(500V)×6 ※1		D/MS3102A20-17P	D/MS3102A20-17S
		Electric signals 5A(220V)×17 ※2		D/MS3102A20-29P	D/MS3102A20-29S
		Electric signals 5A(220V)×37 ※6		D/MS3102A28-21P	D/MS3102A28-21S
Fluid module ※3	FL4AM/FL4BM	4 ports	Master Plate side	4 ports Rc3/8(self-sealing) for both of coolant and pneumatic	
	FL4AT/FL4BT		Tool Plate side		
	FP4AT/FP4BT		Tool Plate side	4 ports Rc3/8(pass-through)for pneumatic	
	FL6AM/FL6BM	6 ports	Master Plate side	6 ports Rc3/8(self-sealing)for both of coolant and pneumatic	
	FL6AT/FL6BT		Tool Plate side		
	FP6AT/FP6BT		Tool Plate side	Rc3/8×6(pass-through)	
Pneumatic port	P38AM(T)*	4 ports		Rc3/8×4(pass-through)	
Electric signal module	JXAM(T)* JXBM(T)*	5A×16 ※7		JMR-2116M-D	JMR-2116F-D
	RXAT* RXBT*	5A×16(without connector)※9			terminal for solder
	MWXAM(T) MWXBM(T)	Resistance to dust and wator 13A×10		D/MS3102A 18-1P	D/MS3102A 18-1S
	BNXAM(BDXAT)* BNXBM(BDXBT)*	non-contact electric signal 15 NPN output		WEBR2119MS-D	WEBR2116FS-D
	BPXAM(BDXAT)* BPXBM(BDXBT)*	non-contact electric signal 15 PNP output		WEBR2119MS-D	WEBR2116FS-D
Ground contact module	E51AM(T)* E51BM(T)*	500A×1(usage：50%)			
Attachment module	GLAM(T) GLBM(T)	Attachment module for A and B side. (For adding conventional Quick change options)			
Cover	LCAM(T) LCBM(T)	Cover for A and B side (always use cover when the modules are not in use)			

■Module for C side and D side

	Model	Capacity and number of contacts	Connector for Master Plate side	Connector for Tool Plate side
Primary current module	WPCM(T) WPDM(T)	200A(usage: 25%)600V Sequence 100A(600V)×3 ※4 Thermo signal: 5A(200V)×3	D/MS3102A36-3P	D/MS3102A36-3S
	WSCM(T) WSDM(T)		Seal connector ABS-3632	
Pneumatic port	P18CM(T)* P18DM(T)*	4 ports	Rc1/8×4(pass-through)	
	P3WCM(T)* P3WDM(T)*	2 ports	Rc3/8×2(pass-through)	
Electric signal module	JCM(T)* JDM(T)*	5A×16 ※7	JMR-2116M-D	JMR-2116F-D
	RCT/RDT	5A×16 (without connector) ※9		terminal for solder
	MCM(T)* MDM(T)*	13A×10 ※8	D/MS3102A18-1P	D/MS3102A18-1S
	MWCM(T) MWDM(T)	Resistance to dust and wator 13A×10	D/MS3102A18-1P	D/MS3102A18-1S
	BNCM(BDCT)* BNDM(BDDT)*	non-contact electric signal 15 NPN output	WEBR2119MS-D	WEBR2116FS-D
	BPCM(BDCT)* BPDM(BDDT)*	non-contact electric signal 15 NPN output	WEBR2119MS-D	WEBR2116FS-D
Ground contact module	E51CM(T)* E51DM(T)*	500A×1(usage：50%)		
Attachment module	GSCM(T) GSDM(T)	Attachment module for C and D side (For fitting conventional Quick change options onto C-side)		
Cover	SCCM(T) SCDM(T)	Cover for C and D side(always use cover when the modules are not in use)		

■Miscellaneous accessories

Lock/unlock Solenoid valve	VE	With solenoid valve for lock/unlock
	VN	Without solenoid valve for lock/umlock

*include attachment module
(※1)Allowable current is Max.20A for pin(13A for pin No.F) and total allowable current is 71.6A for connector. (※2)Allowable current is total 81.7A for connector. (※3)Port with self-sealing of Fluid module cannot be used for vacuum. (※4)Allowable current is total 290.6A for connector. (※5)Allowable current is total 83.7A for connector. Connector has 7 pins. (※6)Allowable current is total 120.2A for connector. (※7)Allowable current is total 30.4A for connector. (※8)Allowable current is total 57.2A for connector. (※9)Type of connector for master side is JMA.

In case of order options as part, model might be different from the above table. Please ask to our company's staff.

Ordering Information

Master plate

GIGA –MN– / –MP– | Module for A-side ☐☐☐AM – | Module for B-side ☐☐☐BM – | Module for C-side ☐☐☐CM – | Module for D-side ☐☐☐DM – | Insulation plate (Adaptor plate with boss) ☐☐☐☐ – | Lock/unlock Solenoid valve ☐☐

(MN=Sensor output NPN / MP=Sensor output PNP)

※Bolt pattern of interface to robot flange is PCD 200mm, M12

Insulation plate (Adaptor plate with boss) (Master Plate side only)

IS	With insulation plate
IN02	Without insulation plate, knock pin x 2
IN12	Without insulation plate, inlay ϕ125
IN16	Without insulation plate, inlay ϕ160

Lock/unlock Solenoid valve

VE	With solenoid valve for lock/unlock ※
VN	Without solenoid valve for lock/unlock

※When you add solenoid valve, usable electric singnal(Built-in) are limited upto 18.

Tool plate

GIGA – T – | Module for A-side ☐☐☐AT – | Module for B-side ☐☐☐BT – | Module for C-side ☐☐☐CT – | Module for D-side ☐☐☐DT – V

【Servo module】

SE	Servo power 20A×6 ※1 Electric signal 5A×17 ※2
SEY	Servo power 20A×6 ※1 Electric signal 5A×17 ※2 Connector for motor has 7pins
SEP	Servo power 20A×6 ※1 Electric signal 5A×17 ※2 Electric signal 5A×37 ※6 37prove contacts is added in serve module
LC	Cover for A and B side (always use the over when the modules are not in use)

【Fluid module】

FL4	4 cooling water ports or pneumatic port
FP4	4 pneumatic ports for Tool Plate
FL6	6 cooling water ports or pneumatic port
FP6	6 pneumatic ports for Tool Plate
LC	Cover for A and B side (always use the over when the modules are not in use)

【Pneumatic port】

P38	Pneumatic Rc3/8×4
LC	Cover for A and B side (always use the over when the modules are not in use)

【Electric signal module】

J	J16A module 5A×16
R	5A×16 for Tool Plate
MW	13A×10 Resistance to dust and wator
BN	Remote sensor 15 NPN output for Master Plate
BP	Remote sensor 15 PNP output for Master Plate
BD	Remote sensor 15 Sensor input for Tool Plate
LC	Cover for A and B side (always use the over when the modules are not in use)

【Other】

E51	500A×1
GL	Attachment module
LC	Cover for A and B side (always use the over when the modules are not in use)

【Primary current module】

WP WS	200A(usage: 25%) 600V Sequence 100A(600V)×3 ※6 Thermo signal: 5A(200V)×3 (WP : receptacle type WS : seal connector type)
SC	Cover for C and D side (always use the cover when the modules are not in use)

【Pneumatic port】

P18	Pneumatic Rc1/8×4
P3W	Pneumatic Rc3/8×2
SC	Cover for C and D side (always use the cover when the modules are not in use)

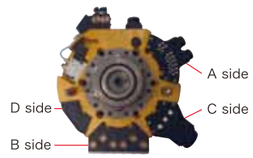
【Electric signal module】

J	J16A module 5A×16
R	5A×16(without connector) for Tool Plate
M	13A×10(insertion contact)
MW	13A×10 Resistance to dust and wator
BN	Remote sensor 15 NPN output (available for master plate only)
BP	Remote sensor 15 PNP output (available for master plate only)
BD	Remote sensor 15 Sensor input (available for tool plate only)
SC	Cover for C and D side (always use the cover when the modules are not in use)

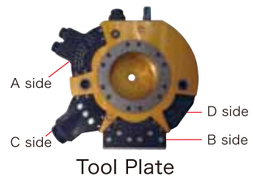
【Other】

E51	500A×1
GS	Attachment module
SC	Cover for C and D side (always use the cover when the modules are not in use)

Installing position



Master Plate



Tool Plate

Please contact BL Autotec, Ltd. for detailed information on the options.

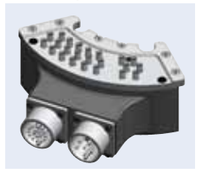
・The electric connector and plugs are user-provided. ・Please contact BL Autotec, Ltd. for detailed information on the modules.
・Please contact BL Autotec, Ltd. for special conditions and specific applications. ・Please refer to the Installation & Maintenance Manual when using.

The configuration and specifications for this series are subject to change.

ZEUS·GIGA Modules

■Examples of optional modules (A or B side)

Master plate side



Servo module
SEAM / SEBM

Fluid module
FL6AM / FL6BM

Attachment module for adding Quick change options onto A·B-side
GLAM / GLBM

Pneumatic port
P38AM / P38BM

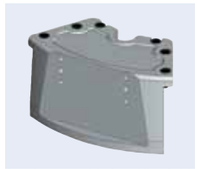
Electric signal module
BPAM / BPBM
BNAM / BNBM

Servo module
SEPAM / SEPBM

■Examples of optional module (C or D side)

Master plate side

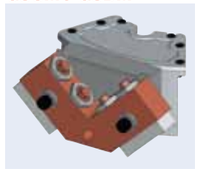
Primary current module
WSCM / WSDM



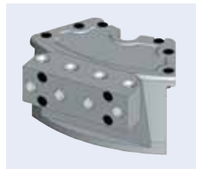
Attachment module for adding Quick change options onto C·D-side
GSCM / GSDM

Electric signal module
JCM / JDM

Electric signal module
M10CM / M10DM

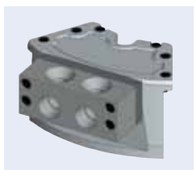


Ground contact module
E51CM / E51DM



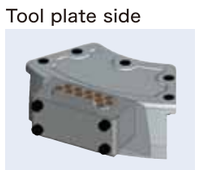
Pneumatic port
P18CM / P18DM

Tool plate side

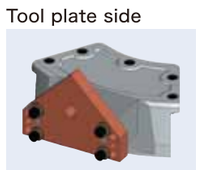


Pneumatic port
P3WCM / P3WDM

Tool plate side



Electric signal module
RCT / RDT



Ground contact module
E51CT / E51DT

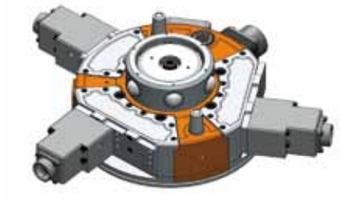
*Please refer to the below table below for details of optional modules.

ZEUS Application Lineup

1 Model for spot welding gun exchange.

2 Model for exchanging jig hands for material handling.

3 Model for exchanging hands or jigs on actuated servo motors.

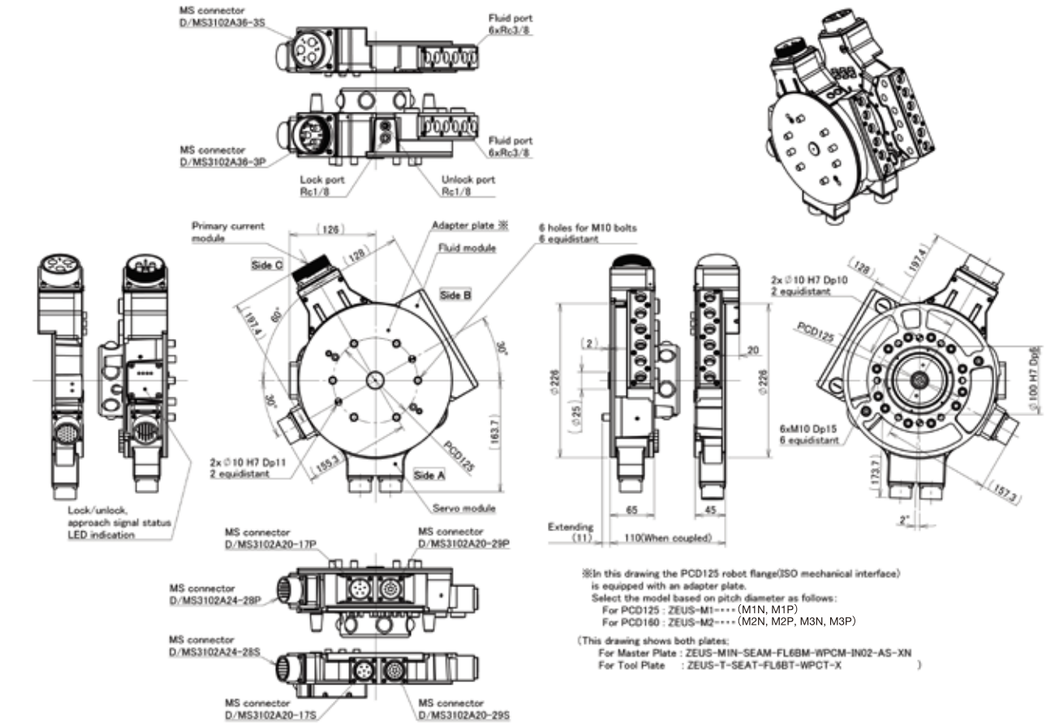


4 Model for high humidity or wet environments. (Remote sensor water-proof IP68 is used for electric signal module)

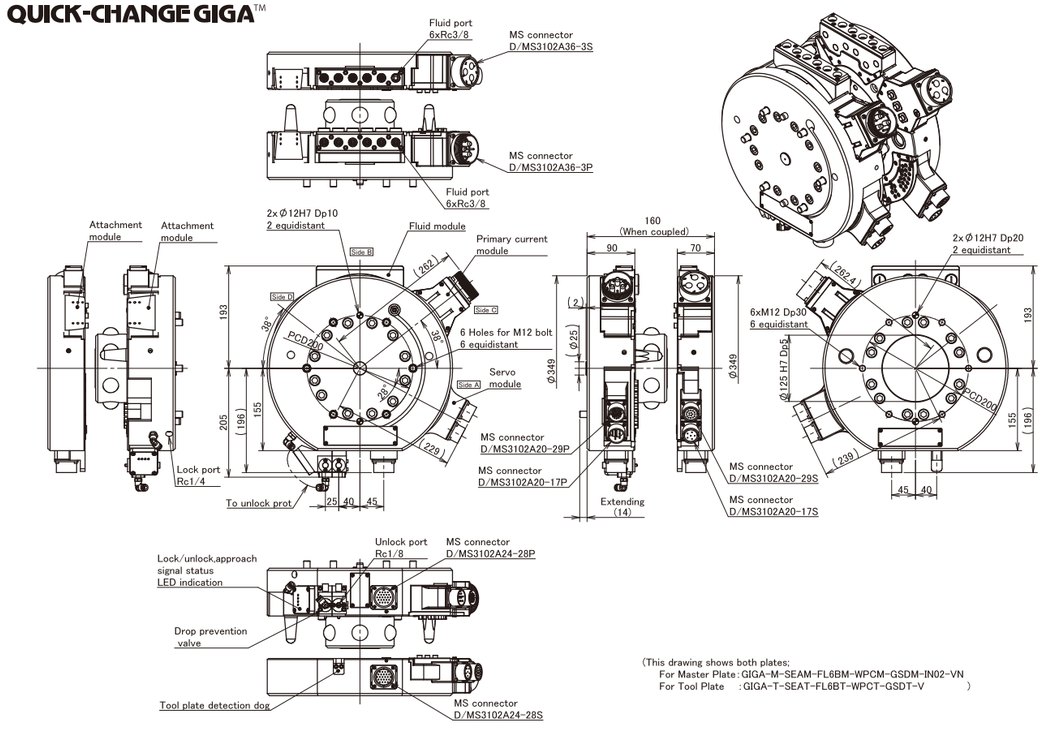
5 Model for exchanging spot welding guns and for handring hands or jigs.

ZEUS·GIGA Main Body Dimensions

QUICK-CHANGE ZEUS™



QUICK-CHANGE GIGA™



QC-1

QC-1 is automatic end-effector exchange device for light load robot for various applications like a assembling of precise electric device, precise machine and handling purpose in medical product, food product.

QC-1 is compatible for use on FANUC's "Genkotsu Robot"

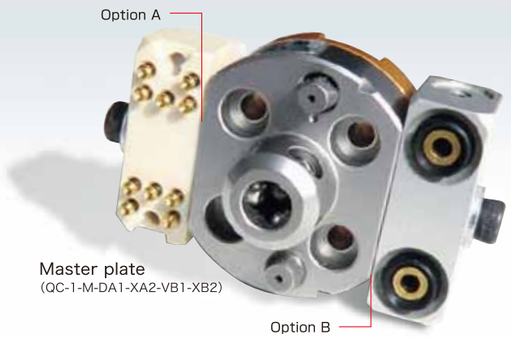
The flange interface on FANUC's Genkotsu Robot 1M-1iA is PCD20(4-axis and 6-axis spacs), so QC-1can be used on new or existing applications.

Lock without touching

The Master plate can lock onto the Tool plate with a gap between them.

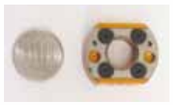
Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.



Master plate
(QC-1-M-DA1-XA2-VB1-XB2)

Tool plate
(QC-1-T-DA1-XA2-VB1-XB2)



Master plate Attachments
·4 bolts(M3×15)
·1 locating pin (MSY3-8)

Specifications

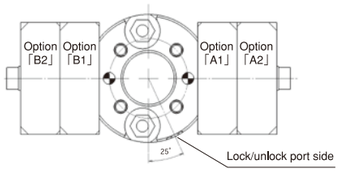
Main Body

Load capacity		9.8N(1kg)
Positional repeatability		±0.015mm
Allowable dynamic moment	Bending direction (Tx, Ty)	4N·m(40.8kgf·cm)
	Twisting direction (Tz)	16.6N·m(169.4kgf·cm)
Coupling force (with air pressure of 0.49MPa) ※1		185N
Materials	Frame	Aluminum alloy
	Lock/ unlock mechanism	Stainless steel
Overall dimension (when coupled)		ϕ32xH29mm
Weight (Main body)	Master plate	60g
	Tool plate	30g
Self-separating mechanism		Ball-locking mechanism
Required air pressure		0.39~0.68MPa(4~7kgf/cm²)
Allowable temperature and humidity ranges		0~50℃、35~90%(Non-condensing)

Options

D	Electric signal contact block	3A×10(solder terminal)
P	Positive pneumatic ports	M3×2
V	Negative pneumatic ports	M3×2

●Installation position on options



QC-1 Ordering Information

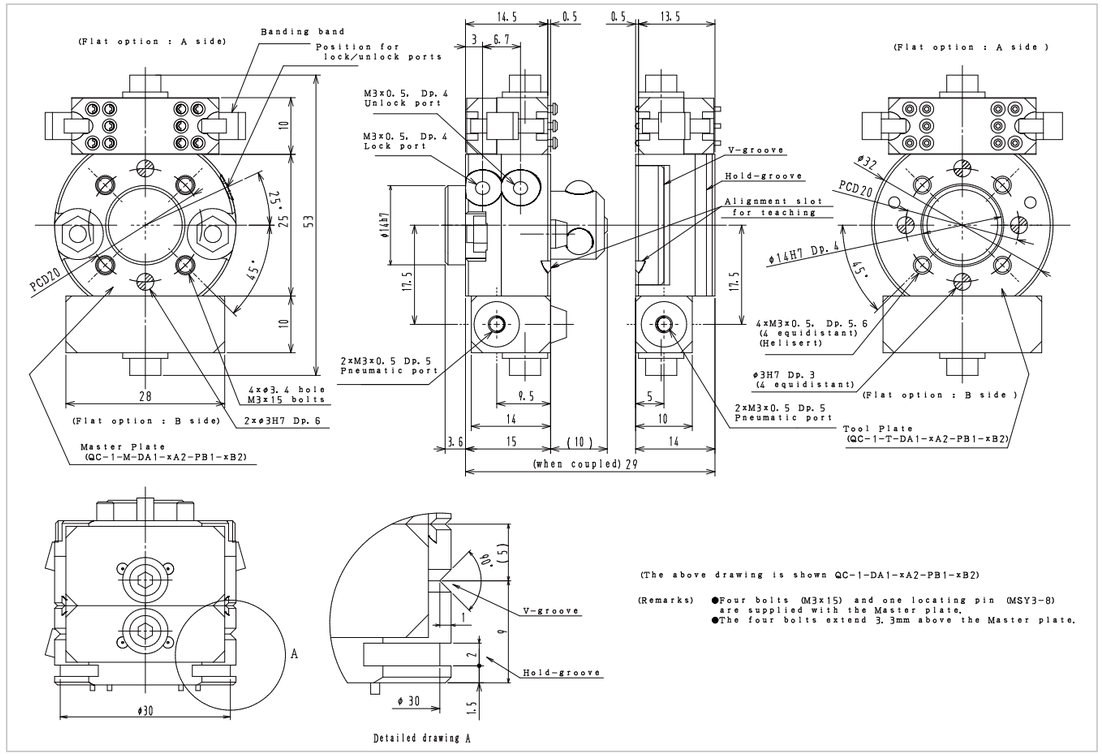
Master plate **QC-1 -M-** (Option) ☐ **A1 -** ☐ **A2 -** ☐ **B1 -** ☐ **B2**

Tool plate **QC-1 -T-** (Option) ☐ **A1 -** ☐ **A2 -** ☐ **B1 -** ☐ **B2**

X	No option
D	Electrical signals3A×10(solder terminal)
P	Positive pneumatic ports ※2
V	Negative pneumatic ports

(Note) Four options may be installed on the QC-1 (the A2 and B2 options available only if the A1 and B1 options are used).

Main Body Dimensions



Options

■Electrical signal contact bloc

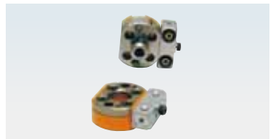
D

3A×10 (solder terminal)

■Pneumatic pressure ports contact bloc

P

For positive pressure M3×2



V

For negative pressure M3×2

Please contact BL Autotec, Ltd. for detailed information on the options.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or device is damaged. ※2 If you request to add 2 pneumatic port block"P", please contact and discuss with BL Autotec before placing order.

Light-5A

The BL QUICK-CHANGE Model Light-5A is a device for automatic tool changing, specially designed for low payload capacity robots, generally used in the assembly and handling of electrical parts, precision equipment and mechanical parts. During the unlocking process, the Light-5A Master plate pushes the Tool plate off (self-separating function). An optional shaft receptacle adaptor is available with the Light-5A to attach it to a shaft-type robot.

Master plate
(Light-5A-M-H20A)

Tool plate
(Light-5A-T-H20A)

Master plate Attachments
・4 bolts(M3×20)
・1 locating pin

Self-separating function

The Light-5A locking mechanism has been designed to push the Tool plate off during the unlocking process, providing reliable separation.

Lock without touching

The Master plate can lock onto the Tool plate with a gap between them.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.

(Notice): Please refer to page 56 for the minimum clearance between the Master Plate and Tool Plate and the gap between the Tool Plate and tool stand for teaching.

Specifications

Main Body

Load capacity (rated load)		49N(5kg)
Positional repeatability		±0.01mm
Allowable dynamic moment	Bending direction(Tx,Ty)	25.4N・m(260 kgf・cm)
	Twisting direction(Tz)	33.2N・m(340 kgf・cm)
Coupling force (with air pressure of 0.49MPa) ※1		612.5N(62.5kgf)
materials	Master plate	Stainless steel
	Tool plate	Aluminum alloy (The lock/unlock mechanism is stainless steel)
Overall dimension (when coupled)		ϕ49xH48.5mm
Weight (main body)	Master plate	260g
	Tool plate	100g
Self-separating mechanism		Ball-locking mechanism (Self-separationg function)
Requuired air pressure		0.39～0.68MPa(4～7kgf/cm²)
Allowable temperature and humidity ranges		0～50℃、35～90%(Non-condensing)
Utilities	Pneumatic ports	M5×6

Options

Utilities	H10A	Electrical signals Max3A DC50V Probe contact	3A×10 (solder terminal)
	H20A		3A×20 (solder terminal)
	H30A		3A×30 (solder terminal)
	H10L		3A×10 (with 1m lead wires)
	H20L		3A×20 (with 1m lead wires)
Shaft receptacle adaptor			For shaft diameters of 8,9,10,11, 12,13,14,15,16,20,24 and 25mm

Light-5A Ordering Information

Master plate **Light-5A -M-** (Option) □□□□ – (Shaft receptacle adaptor) □□□□

Tool plate **Light-5A -T-** (Option) □□□□

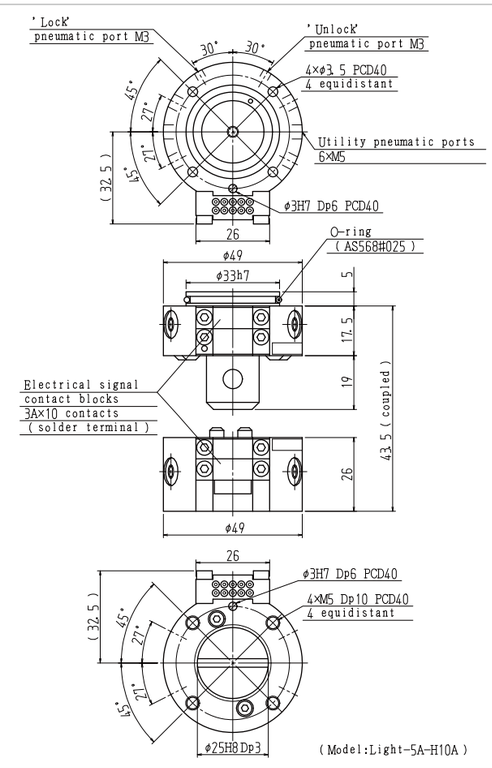
XXXA	No electrical signal
H10A	Electrical signals3A×10 (solder terminal)
H20A	Electrical signals3A×20 (solder terminal)
H30A	Electrical signals3A×30 (solder terminal)
H10L	Electrical signals3A×10 (with 1m lead wires)
H20L	Electrical signals3A×20 (with 1m lead wires)

XXXB	No adaptor
SA○○	Shaft receptacle adaptor

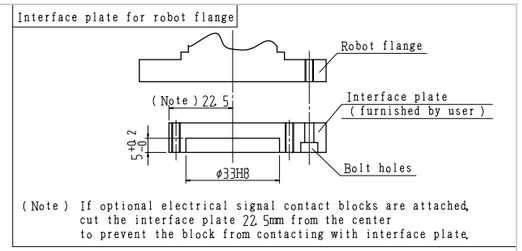
Note : ○○ is shaft diameter.
(For example, for a diameter of ϕ8mm, use 08, for a diameter of ϕ16mm,use 16.)

※Light-5A is interchangeable with the previous Light-5.

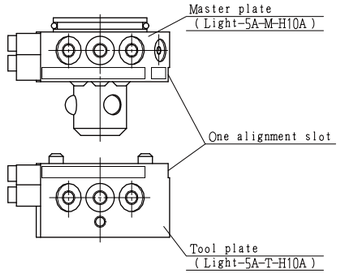
Main Body Dimensions



(Model:Light-5A-H10A)



(Note) If optional electrical signal contact blocks are attached, cut the interface plate 22.5mm from the center to prevent the block from contacting with interface plate.



●Four bolts (M3x20mm) and one locating pin (MSY3-15) are supplied with the Master plate.
●The four bolts extend 7.5mm above the Master plate.

Options

■Electrical signal contact bloc

H10A
3A×10 (solder terminal)

H20A
3A×20 (solder terminal)

H30A
3A×30 (solder terminal)

H10L
3A×10 (with 1m lead wires)

■Shaft receptacle adaptor

H20L
3A×20 (with 1m lead wires)

SA○○
Adaptor for robots with shafts for mounting

Note : ○○ is shaft diameter.
(For example, for a diameter of ϕ8mm, use 08, for a diameter of ϕ16mm,use 16.)

Please contact BL Autotec, Ltd. for detailed information on the options.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or device is damaged.

QC-10B

Master plate Attachments
・4 bolts (M3×25)
・1 locating pin
※Seal plate, O-ring and screws are pre-assembled.

Lock without touching

The Master plate can lock onto the Tool plate with a gap between them.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.

Specifications

Main Body

Load capacity (rated load)		98N(10kg)
Positional repeatability		±0.01mm
Allowable dynamic moment	Bending direction (Tx, Ty)	49N・m(500kgf・cm)
	Twisting direction (Tz)	68.6N・m(700kgf・cm)
Coupling force (with air pressure of 0.49MPa) ※1		970.8N(99kgf)
Materials	Master plate	Stainless steel
	Tool plate	Aluminum alloy (The lock/unlock mechanism is stainless steel.)
Overall dimension (when coupled)		ϕ50×H38.5mm
Weight (Main dody)	Master plate	245g
	Tool plate	85g
Self-separating mechanism		Ball-locking mechanism
Required air pressure		0.39~0.68MPa(4~7kgf/cm²)
Allowable temprature and humidity ranges		0~50℃、35~90%(Non-condensing)
Utilities	Pneumatic ports	M5×6

Options

Utilities	K10A	Electrical signals Max3A DC50V Probe contact	3A×10 (solder terminal)
	K20A		3A×20 (solder terminal)
	K10L		3A×10 (with 1m lead wires)
	K20L		3A×20 (with 1m lead wires)

QC-10B Ordering Information

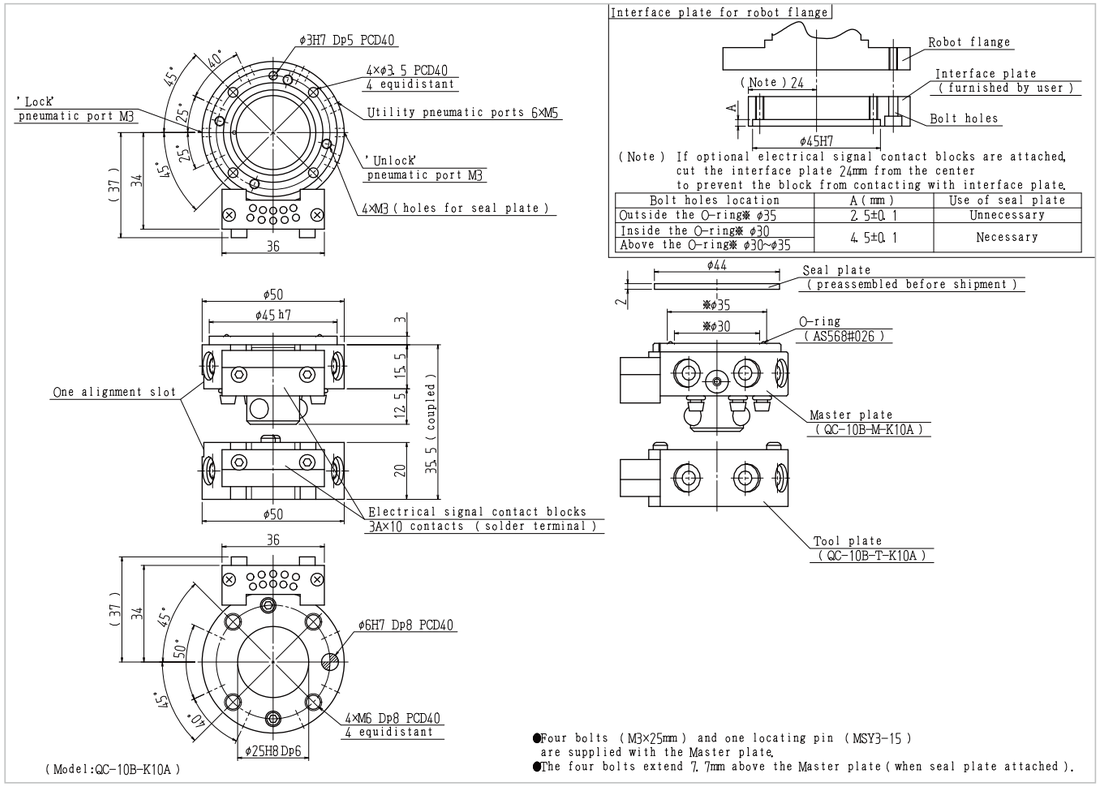
Master plate **QC-10B -M-** (Option) □□□□

Tool plate **QC-10B -T-** (Option) □□□□

XXXA	No electrical signal
K10A	Electrical signals 3A×10 (solder terminal)
K20A	Electrical signals 3A×20 (solder terminal)
K10L	Electrical signals 3A×10 (with 1m lead wires)
K20L	Electrical signals 3A×20 (with 1m lead wires)

Electric signal contact block for QC-10A is compatible with QC-10B.
Please specify the electric signal contact block when ordering.

Main Body Dimensions



Options

■Electrical signal contact block

K10A
3A×10 (solder terminal)

K20A
3A×20 (solder terminal)

K10L
3A×10 (with 1m lead wires)

K20L
3A×20 (with 1m lead wires)

Please contact BL Autotec, Ltd. for detailed information on the options.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or device is damaged.

QC-20D

Lock without touching

The Master plate can lock onto the Tool plate with a gap between them.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.

Master plate
(QC-20D-M-DAPA)

Tool plate
(QC-20D-T-DAPA)

Master plate Attachments
・4 bolts(M4×30)
・1 locating pin
※Seal plate, O-ring and screws are pre-assembled.

Specifications

Main Body

Load capacity (rated load)		196N(20kg)
Positional repeatability		±0.015mm
Allowable dynamic moment	Bending direction (Tx, Ty)	113.6N・m(1,160kgf・cm)
	Twisting direction (Tz)	156.8N・m(1,600kgf・cm)
Coupling force (with air pressure of 0.49MPa) ※1		2,059N(210kgf)
Materials	Frame	Aluminum alloy
	Lock/unlock mechanism	Stainless steel
Overall dimension (when coupled)		φ90×H45.4mm
Weight (Main body)	Master plate	515g
	Tool plate	355g
Self-separating mechanism		Ball-locking mechanism
Required air pressure		0.39～0.68MPa(4～7kgf/cm²)
Allowable temty perature and humidity ranges		0～50℃、35～90%(Non-condensing)

Types

Utilities	DXPA	Electrical signals	None
		Pneumatic ports	M5×8
	DXPB	Electrical signals	None
		Pneumatic ports	M5×12
	DAPA	Electrical signals Max3A DC50V Probe contact	3A×15 (D-sub connector) ※2
		Pneumatic ports	M5×8
	DAPB	Electrical signals Max3A DC50V Probe contact	3A×15 (D-sub connector) ※2
		Pneumatic ports	M5×12
	DBPA	Electrical signals Max3A DC50V Probe contact	3A×30 (D-sub connector) ※2
		Pneumatic ports	M5×8

QC-20D Ordering Information

Master plate **QC-20D -M-** (Type) □□□□

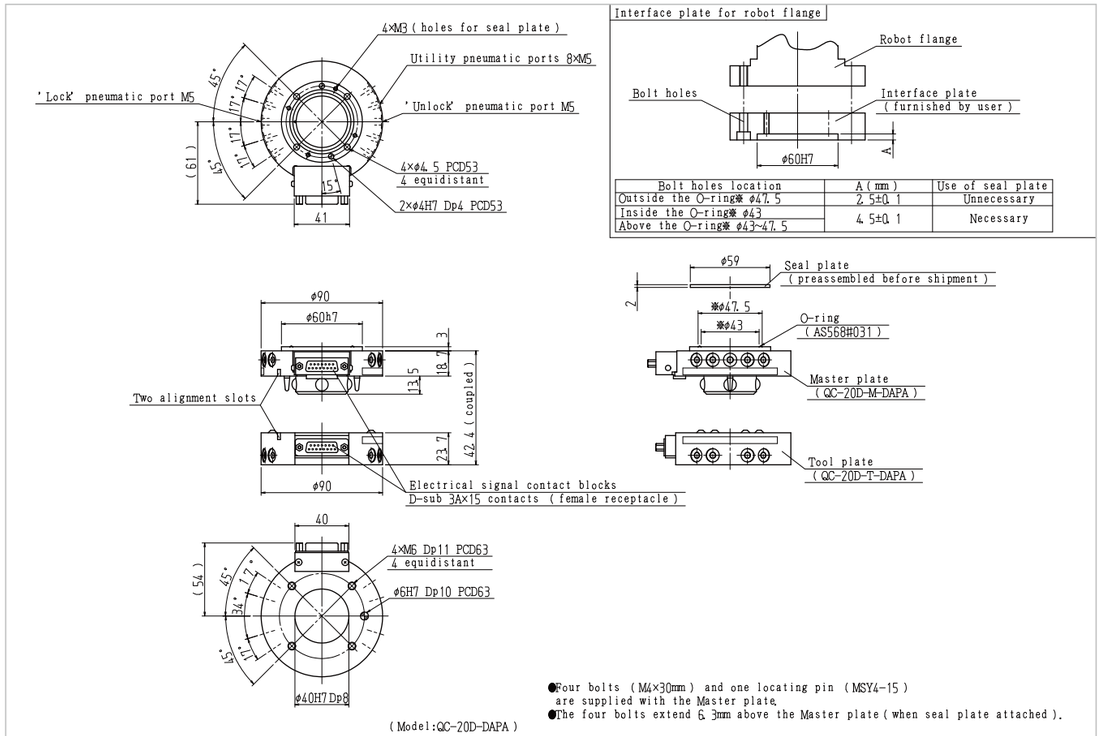
Tool plate **QC-20D -T-** (Type) □□□□

DXPA	No electrical signal	Pneuma tic ports M5×8
DXPB	No electrical signal	Pneumatic ports M5×12
DAPA	Electrical signals 3A×15※2	Pneumatic ports M5×8
DAPB	Electrical signals 3A×15※2	Pneumatic ports M5×12
DBPA	Electrical signals 3A×30※2	Pneumatic ports M5×8

(Note) Please order D15N-M for the master side and model D15N-T for the tool side when ordering a contact block replacement.

※QC-20D is interchangeable with previous QC-20A, B and C.

Main Body Dimensions



Types

■No electrical signal

DXPA
Pneumatic ports M5×8

DXPB
Pneumatic ports M5×12

■Electrical signals

DAPA
3A×15 D-Sub 15 contacts (female receptacle)※2
Pneumatic ports M5×8

DAPB
3A×15 D-Sub 15 contacts (female receptacle)※2
Pneumatic ports M15×12

DBPA
3A×30 D-Sub 15 contacts (female receptacle)※2
Pneumatic ports M5×8

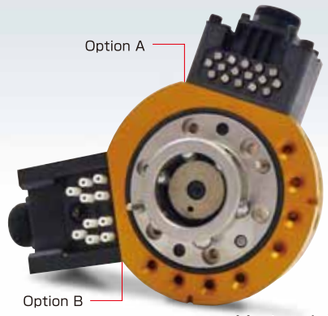
※The connector plug DDK, 17JE-23 150-02 (DBA) -CG, or its equivalent, is user-provided.

Please contact BL Autotec, Ltd. for detailed information on the options.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or device is damaged. contacts male screw plug M2.6)
※2. Please provide a 17JE-23150-02(D8A)-CG plug or its equivalent.(D-sub plugs are RoHS.)

Flex-40B

The BL QUICK-CHANGE Model Flex-40B is a device for automatic tool changing, designed to enable robots and automated equipment to automatically change end-effectors or other peripheral tooling. A ball-locking mechanism allows for high coupling force and increased moment. To meet your specific application requirements, such as material handling, assembly and deburring, you may select various options in pneumatic ports and electrical contacts, including motor-driving ampere capacity.



Master plate
(Flex-40B-M-J16A-M10B-SX)

Various Range of Utilities

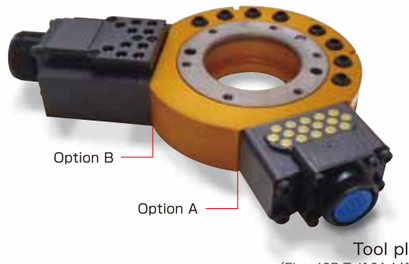
The system can be structured to meet individual customer applications by varying the size and number of electrical contacts and pneumatic ports.

Lock without touching

The Master plate can lock onto the Tool plate with a gap between them.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature witch does not allow the Master and Tool plates to uncouple if the air pressure is shut off.



Tool plate
(Flex-40B-T-J16A-M10B)

Master plate Attachments
・6 bolts(M5×35)
・1 locating pin
※Seal plate, O-ring and screws are pre-assembled.

Specifications

Main Body

Load capacity (rated load)		392N(40kg)
Posisional repeatability		±0.015mm
Allowable dynamic moment	Bending direction (Tx, Ty)	314N·m(32kgf·m)
	Twisting direction (Tz)	430N·m(44kgf·m)
Coupling force (with air pressure of 0.49MPa) ※1		4,000N(408kgf)
Mterials	Frame	Aluminum alloy
	Lock/unlock mechanism	Stainless steel
Overall dimension (when coupled)		ϕ115×H57mm
Weight (Main body)	Master plate	1,140g
	Tool plate	610g
Self-separating mechanism		Ball-locking mechanism
Required air pressure		0.39~0.68MPa(4~7kgf/cm²)
Allowable temperature and humidity ranges		0~50℃、35~90%(Non-condensing)
Utilities	Pneumatic ports	Rc1/8×8

Options

Utilities	D15A D15B	Electrical signals Max3A DC50V Probe contact	3A×15 ※2
	J16A J16B	Electrical signals Max5A DC/AC200V Probe contact	5A×16 本 ※3 ※4
	M10A M10B	Electrical signals Max13A DC250/AC200V Insertion contact	13A×10 ※3 ※5
	A16A A16B	Electrical signals Max5A DC/AC200V Probe contact	Approach sensor 5A×16 ※3 ※4
	A08A A08B	Electrical signals Max13A DC250/AC200V Insertion contact	Approach sensor 13A×8 ※3 ※5
	B15NA B15NB B15PA B15PB	Electric signals Max.50mA DC24V Non-contact system (Please refer to page 41 for details.)	50mA×15 WEB series connector ※3 In Zone 1 IP67
	B15DA B15DB	Electric signals Max.5mA DC12V Non-contact system (Please refer to page 41 for details.)	5mA×15 WEB series connector ※3 IP67
	P18A. P18B	Pneumatic ports	Rc1/8×4
	P14A. P14B	Pneumatic ports	Rc1/4×2
Lock/unlock sensor ※6			Two built-in proximity switches

Flex-40B Ordering Information

Master plate **Flex-40B -M-** (Option A) – (Option B) – (Lock/unlock sensor)

Tool plate **Flex-40B -T-** (Option A) – (Option B)

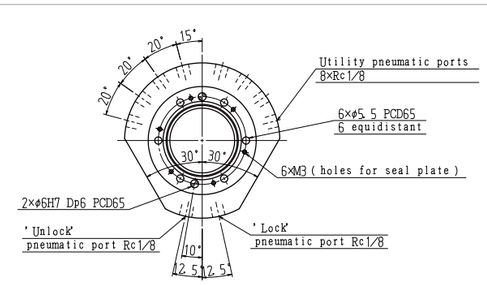
(Option A)	
XXXA	No option
D15A	Electrical signals 3A×15※2
J16A	Electrical signals 5A×16※3 ※4
M10A	Electrical signals 13A×10※3 ※5
B15NA	Non-contact electric signal block Master side NPN output
B15P	Non-contact electric signal block Master side PNP output
B15D	Non-contact electric signal block Tool side
A16A	Approach sensor + Electrical signals 5A×16※3 ※4
A08A	Approach sensor + Electrical signals 13A×8※3 ※5
P18A	Pneumatic ports Rc1/8×4
P14A	Pneumatic ports Rc1/4×2

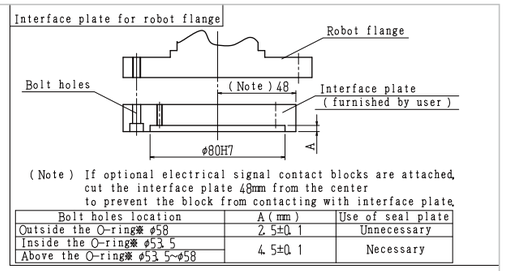
(Option B)	
XXXB	No option
D15B	Electrical signals 3A×15※2
J16B	Electrical signals 5A×16※3 ※4
M10B	Electrical signals 13A×10※3 ※5
B15NB	Non-contact electric signal block Master side NPN output
B15P	Non-contact electric signal block Master side PNP output
B15D	Non-contact electric signal block Tool side
A16B	Approach sensor + Electrical signals 5A×16※3 ※4
A08B	Approach sensor + Electrical signals 13A×8※3 ※5
P18B	Pneumatic ports Rc1/8×4
P14B	Pneumatic ports Rc1/4×2

(Lock/unlock sensor)	
SX	No lock/unlock sensor
SA	Lock/unlock sensor A-type (Customer processes the adaptor plate)
SB	Lock/unlock sensor B-type (BL. Autotec processes the adaptor plate)

※Flex-40B is interchangeable with the previous Flex-40 and Flex-40A.

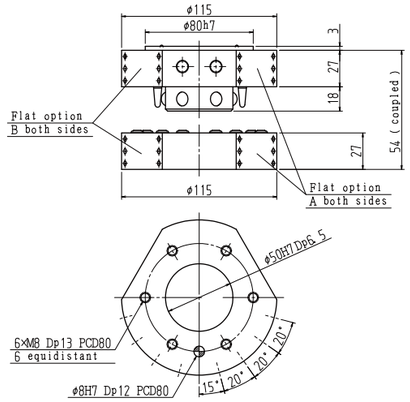
Main Body Dimensions

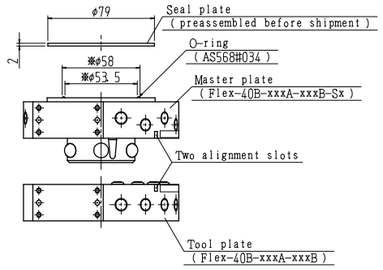




(Note) If optional electrical signal contact blocks are attached, cut the interface plate 48mm from the center to prevent the block from contacting with interface plate.

Bolt holes location	A (mm)	Use of seal plate
Outside the O-ring※ ϕ58	2.5±0.1	Unnecessary
Inside the O-ring※ ϕ53.5	4.5±0.1	Necessary
Above the O-ring※ ϕ53.5~ϕ58		



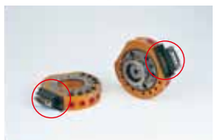


(Model:Flex-40B-xxxA-xxxB-Sx)

●Six bolts (M5×35mm) and one locating pin (MSY6-20) are supplied with the Master plate.
●The six bolts extend 8.4mm above the Master plate (when seal plate attached).

Options

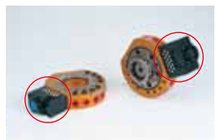
■Electrical signal contact block



D15A,D15B

3A×15 D-sub 15 contacts (female receptacles)※2

※Plug side is DDK, 17JE-23150-02 (D8A) -CG, or its equivalent.



J16A,J16B

5A×16 (JM connector)※3 ※4

Use JMR2116M-D for the J16A master side
Use JMR2116F-D for the J16A Tool side
Use JMR2116MX-D for the J16B Master side
Use JMR2116FX-D for the J16B Tool side

M10A,M10B

13A×10 (MS connector)※3 ※5

Use D/MS3102A18-1P for the M10A master side
Use D/MS3102A18-1S for the M10A Tool side
Use D/MS3102A18-19P for the M10B Master side
Use D/MS3102A18-19S for the M10B Tool side

A16A,A16B

Approach Sensor
5A×16 (JM connector)※3 ※4

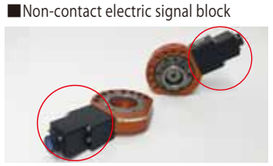
Use JMR2119M-D for the A16A master side
Use JMR2116F-D for the A16A Tool side
Use JMR2119MX-D for the A16B Master side
Use JMR2116FX-D for the A16B Tool side

A08A,A08B

Approach Sensor
13A×8 (MS connector)※3 ※5

U se D/MS3102A18-1P for the A08A master side
Use D/MS3102A18-1S for the A08A Tool side
Use D/MS3102A18-19P for the A08B Master side
Use D/MS3102A18-19S for the A08B Tool side

■Non-contact electric signal block



B15NA/B,B15PA/B(Master side only)
B15DA/B(Tool side only)

B15NA/B NPN output
B15PA/B PNP output

Receptacle connector: WEBR-2119S-D for B15NA/B and B15PA/B
Receptacle connector: WEBR-2119FS-D for B15DA/B

■Pneumatic ports

P18A,P18B

Rc1/8×4

P14A,P14B

Rc1/4×2

■Lock/unlock sensor

SA,SB

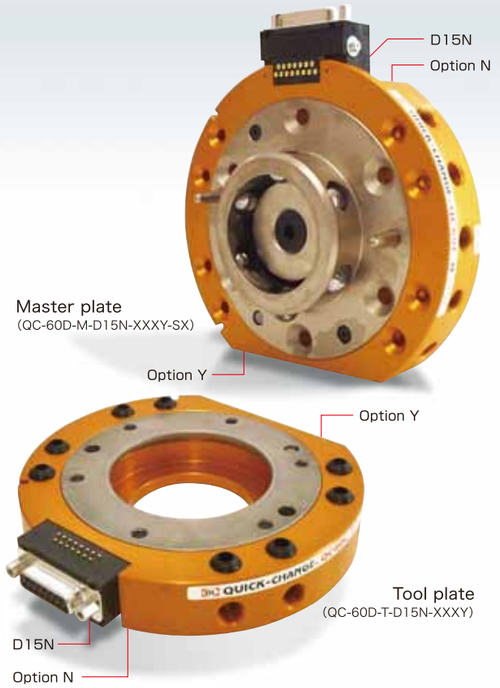
Two built-in proximity switches verify piston position, thus reliably checking the lock and unlock status.

Please contact BL Autotec, Ltd. for detailed information on the options.

SA Type・・・The sensor plate can be used in place of an interface plate with modifications by the user
SB Type・・・The sensor plate can be used in place of an interface plate with modifications by BL Autotec ,Ltd.
※When you order the lock/unlock sensor please provide us with a drawing of the robot flange.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or the device is damaged. ※2 User to provide connector plugs (17JE-23150-02(D8A)-CG or the equivalent). ※3 Plug is not included. Please see the table on page 46 for connectors. ※4 Allowable current is total 30.4A for connector. ※5 Allowable current is total 57.2A for connector. ※6 An option is available on the electric signal contact block (J16A, M10A, A16A, A08A) to connect the Lock/unlock proximity switch signal. Please contact us for additional information.

QC-60D



Lock without touching

The Master plate can lock onto the Tool plate with a gap between them.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.

Master plate Attachments
·6 bolts (M6×40)
·1 locating pin
※Seal plate, O-ring and screws are pre-assembled.

Specifications

Main Body

Load capacity (rated load)		588N(60kg)
Positinal repeatability		±0.015mm
Allowable dynamic moment	Bending direction (Tx, Ty)	392N·m (40kgf·m)
	Twisting direction (Tz)	588N·m (60kgf·m)
Coupling force (with air pressure of 0.49MPa)		6,570N(670kgf) ※1
Materials	Frame	Aluminum alloy
	Lock/unlock mechanism	Stainless steel
Overall dimension (when coupled)		ϕ130xH50mm
Weight (Main body)	Master plate	1,340g
	Tool plate	720g
Self-separating mechanism		Ball-locking mechanism
Required air pressure		0.39~0.68MPa(4~7kgf/cm²)
Allowable temperature and humidity ranges		0~50℃、35~90%(Non-condensing)

Main Body

Utilities	Electrical signals Max3A DC50V Probe contact	3A×15 or none ※2
	Pneumatic ports	Rc1/8×8

Options

Utilities	D15Y	Electrical signals	3A×15 ※2
	J16Y	Electrical signals	5A×16 ※3 ※4
	M06Y	Electrical signals	13A×6 ※3 ※5
	M10Y	Electrical signals	13A×10 ※3 ※6
	B15NY B15PY	Electric signals Max.50mA DC24V Non-contact system (Please refer to page 41 for details.)	50mA×15 WEB series connector ※3 In Zone 1 IP67
	B15DY	Electric signals Max.5mA DC12V Non-contact system (Please refer to page 41 for details.)	5mA×15 WEB series connector ※3 IP67
	P18Y	Pneumatic ports	Rc1/8×4
	P14Y	Pneumatic ports	Rc1/4×2
Lock / unlock sensor ※7			Two built-in proximity switches

QC-60D Ordering Information

Master plate **QC-60D** **-M-** (Option N) – (Option Y) – (Lock / unlock sensor)

Tool plate **QC-60D** **-T-** (Option N) – (Option Y)

(Option N)	
DXXN	No electrical signal
D15N	Electrical signals 3A×15※2

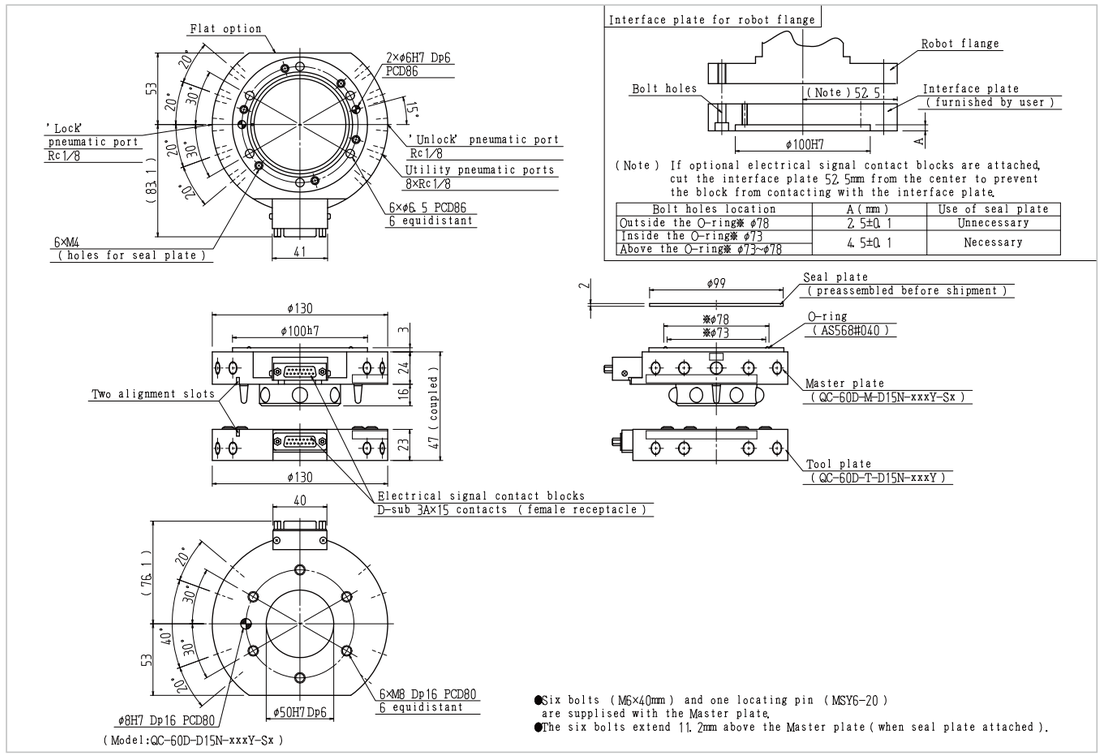
(Option Y)	
XXXY	No option
D15Y	Electrical signals 3A×15※2
J16Y	Electrical signals 5A×16※3 ※4
M06Y	Electrical signals 13A×6※3 ※5
M10Y	Electrical signals 13A×10※3 ※6
B15NY	Non-contact electric signal block Master side NPN output
B15PY	Non-contact electric signal block Master side PNP output
B15DY	Non-contact electric signal block Tool side
P18Y	pneumatic ports Rc 1/8×4
P14Y	pneumatic ports Rc 1/4×2

(Lock / unlock sensor)	
SX	No lock/unlock sensor
SA	Lock/unlock sensor A-Type (Customer processes the adaptor plate)
SB	Lock/unlock sensor B-Type (BL.Autotec processes the adaptor plate)

(Note) Electric signal contact block types for QC-60D are shown at follows.
(Type of electric signal contact block when the Master side is D15N-M: the tool side is D15N-T.).

※QC-60D is interchangeable with the previous QC-60A,B and C.

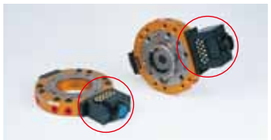
Main Body Dimensions



Options

■Electrical signal contact block

D15Y
3A×15 D-sub 15 contacts (female receptacles)※2
※Plug side is DDK. 17 JE-23150-02 (D8A) -CG. or its equivalent.

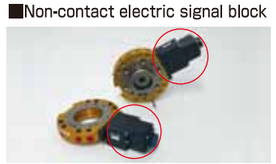


J16Y
5A×16 (JM connector)※3 ※4
Use JMR2116M-D for the J16Y Master side
Use JMR2116F-D for the J16Y Tool side

M06Y
13A×6 (MS connector)※3 ※5
Use D/MS3102A14S-6P for the M06Y Master side
Use D/MS3102A14S-6S for the M06Y Tool side

M10Y
13A×10 (MS connector)※3 ※6
Use D/MS3102A18-1P for the M10Y Master side
Use D/MS3102A18-1S for the M10Y Tool side

■Non-contact electric signal block



B15NY,B15PY(Master side only)
B15DY(Tool side only)
B15NY NPN output
B15PY PNP output
Receptacle connector: WEBR-2119S-D for B15NY and B15PY
Receptacle connector: WEBR-2116FS-D for B15DY

■Pneumatic ports

P18Y
Rc1/8×4

P14Y
Rc1/4×2

■Lock/unlock sensor

SA,SB
Two built-in proximity switches verify piston position, thus reliably checking the lock and unlock status.

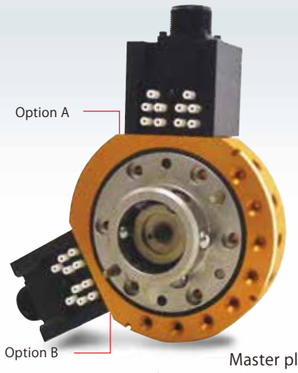
Please contact BL Autotec, Ltd. for detailed information on the options.

SA Type…The sensor plate can be used in place of an interface plate with modifications by the user
SB Type…The sensor plate can be used in place of an interface plate with modifications by BL Autotec ,Ltd.
※When you order the lock/unlock sensor please provide us with a drawing of the robot flange.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or the device is damaged. ※2 Plug connector is not included. Please prepare plug connector type 17JE-23150-02(D8A)-CG or compatible type. ※3 Plug connector is not included. Please prepare plug connector by customer. For connector, please see correspondence table on page 46. ※4 Allowable current is total 30.4A for connector. ※5 Allowable current is total 43.6A for connector. ※6 Allowable current is total 57.2A for connector. ※7 An option is available on the electric signal contact block (J16Y, M10Y) to connect the Lock/unlock proximity switch signal. Please contact us for additional information.

Flex-70A

Flex-70 is attached to the robot flange for quick and reliable exchange of end-effectors, such as tools. The ball-lock system in the Tool Plate is a sturdy specification, even for moment loads. A ground and approach sensor are now available as options in addition to conventional pneumatic ports, electric signals and a lock/unlock sensor. May be used in welding, press handling and deburring applications. Earth contact and electric signal module with approach sensor are added as option to usual electric signal contact blocks, pneumatic port blocks and lock/unlock sensor.



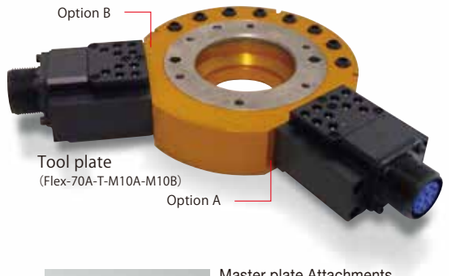
Master plate
(Flex-70A-M-M10A-M10B-SX)

Heavy duty applications

For heavy duty applications, such as deburring, a special seal prevents dust from entering the locking mechanism and electrical contacts when the plates are coupled.

Various range of utilities

In addition to traditional air ports, electrical signals and a lock/unlock sensor, an approach sensor and a ground can be added.



Large misalignment correction capability

The unique design corrects misalignment when the Master and Tool plates couple. An approach sensor system, built into the plates, verifies coupling capability.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.

Master plate Attachments
- 6 bolts (M6×40)
- 1 locating pin

※Seal plate, O-ring and screws are pre-assembled.

Specifications

Main Body

Load capacity (rated load)		686N (70kg)
Positional repeatability		±0.015mm
Allowable dynamic moment	Bending direction (Tx, Ty)	686N・m (70kgf・m)
	Twisting direction (Tz)	784N・m (80kgf・m)
Coupling force (with air pressure of 0.49 Mpa) ※1		7,056N(720kgf)
Materials	Frame	Aluminum alloy
	Lock/unlock mechanism	Stainless steel
Overall dimension (when coupled)		φ139×H65mm
Weight (Main body)	Master plate	1,900g
	Tool plate	1,200g
Self-separating mechanism		Ball-locking mechanism
Required air pressure		0.39～0.68MPa (4～7kgf/cm²)
Allowable temperature and humidity ranges		0～50℃, 35～90% (Non-condensing)
Utilities	Pneumatic ports	Rc1/8×8

※1 Coupling force is the force to achieve specified repeatability. Coupling force will be maintained until unlock pressure is applied or the device is damaged.
※2 The connector plug is user-provided.
※3 Cables of Lock/unlock sensors (proximity sensor) can be connected optional connectors (J16A, M10A, A16A, A08A). Please contact BL. Autotec, Ltd. for further information.

Options

Utilities	D15A. D15B	Electrical signals	3A×15 ※2
	J16A. J16B	Electrical signals	5A×16 ※3 ※4
	M10A. M10B	Electrical signals	13A×10 ※3 ※5
	A16A. A16B	Electrical signals	Approach Sensor + 5A×16 ※3 ※4
	A08A. A08B	Electrical signals	Approach Sensor + 13A×8 ※3 ※5
	B15NA B15NB B15PA B15PB	Electric signals Max.50mA DC24V Non-contact system (Please refer to page 41 for details.)	50mA×15 WEB series connector ※3 In Zone 1 IP67
	B15DA B15DB	Electric signals Max.5mA DC12V Non-contact system (Please refer to page 41 for details.)	5mA×15 WEB series connector ※3 IP67
	E50A. E50B	Ground	500A (50% usage) ×1
	P18A. P18B	Pneumatic ports	Rc1/8×4
	P14A. P14B	Pneumatic ports	Rc1/4×2
	P3WA. P3WB	Pneumatic ports	Rc3/8×2
Lock/unlock sensor ※6			Two built-in proximity switches

Flex-70A Ordering Information

Master plate: Flex-70A -M- (Option A) – (Option B) – (Lock/unlock sensor)

Tool plate: Flex-70A -T- (Option A) – (Option B)

XXXA	No option
D15A	Electrical signals 3A×15※2
J16A	Electrical signals 5A×16※3 ※4
M10A	Electrical signals 13A×10※3 ※5
A16A	Approach sensors + Electrical signals 5A×16※3 ※4
A08A	Approach sensors + Electrical signals 13A×8※3 ※5
B15NA	Non-contact electric signal block Master side NPN output
B15PA	Non-contact electric signal block Master side PNP output
B15DA	Non-contact electric signal block Tool side
◎ E50A	Ground 500A×1
P18A	Pneumatic ports Rc1/8×4
P14A	Pneumatic ports Rc1/4×2
◎ P3WA	Pneumatic ports Rc1/8×2

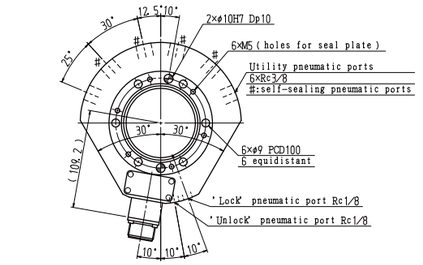
XXXB	No option
D15B	Electrical signals 3A×15※2
J16B	Electrical signals 5A×16※3 ※4
M10B	Electrical signals 13A×10※3 ※5
A16B	Approach sensors + Electrical signals 5A×16※3 ※4
A08B	Approach sensors + Electrical signals 13A×8※3 ※5
B15NA	Non-contact electric signal block Master side NPN output
B15PB	Non-contact electric signal block Master side PNP output
B15DB	Non-contact electric signal block Tool side
◎ E50B	Ground 500A×1
P18B	Pneumatic ports Rc1/8×4
P14B	Pneumatic ports Rc1/4×2
◎ P3WB	Pneumatic ports Rc1/8×2

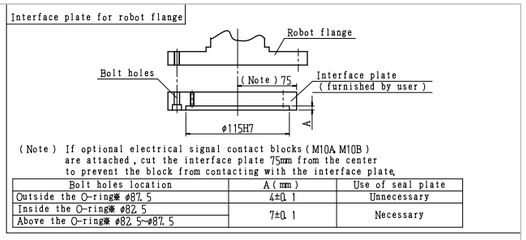
SX	No Lock/unlock Sensor
SA	Lock/unlock Sensor A type (Customer processes the adptor plate)
SB	Lock/unlock Sensor B type (BL. Autotec processes the adptor plate)

Note: ◎Combination of E50A & E50B, PC3WA & PC3WB, PC3WA & E50B cannot be used on the same Flex-70A.

※In case combing Flex-70(old version) & Flex-70A (current version), pls confirm a serial number & let us know accordingly.

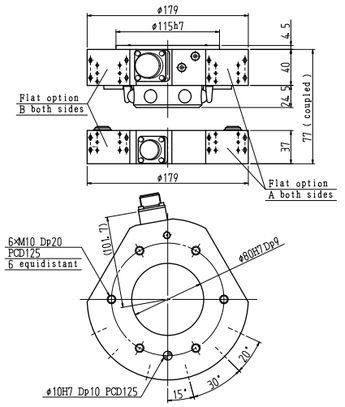
Main Body Dimensions

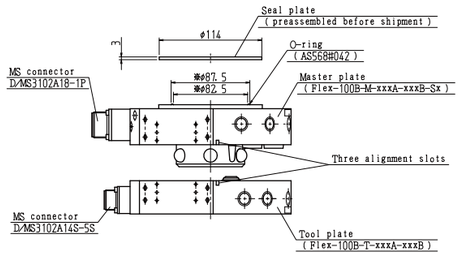




(Note) If optional electrical signal contact blocks (M10A M10B) are attached, cut the interface plate 75mm from the center to prevent the block from contacting with the interface plate.

Bolt holes location	A (mm)	Use of seal plate
Outside the O-ring※ φ87.5	45±0.1	Unnecessary
Inside the O-ring※ φ82.5	7±0.1	Necessary
Above the O-ring※ φ82.5-φ87.5		





(Model:Flex-100B-xxxA-xxxB-Sx)

●Six bolts (M8×55mm) and one locating pin (MSY10-30) are supplied with the Master plate.
●The six bolts extend 16.0mm above the Master plate (when seal plate attached).

Options

■Electrical signal contact block

D15A,D15B

3A×15 D-sub 15 contacts (female receptacles)※2

※Plug side is DDK, 17JE-23150-02(D8A) -CG, or its equivalent.

J16A,J16B

5A×16 (JM connector)※3 ※4

Use JMR2116M-D for the J16A master side
Use JMR2116F-D for the J16A Tool side
Use JMR2116MX-D for the J16B Master side
Use JMR2116FX-D for the J16B Tool side

M10A,M10B

13A×10 (MS connector)※3 ※5

Use D/MS3102A 18-1P for the M10A master side
Use D/MS3102A 18-1S for the M10A Tool side
Use D/MS3102A 18-19P for the M10B Master side
Use D/MS3102A 18-19S for the M10B Tool side

A16A,A16B

Approach Sensor
5A×16 (JM connector)※3 ※4

Use JMR2119M-D for the A16A master side
Use JMR2116F-D for the A16A Tool side
Use JMR2119MX-D for the A16B Master side
Use JMR2116FX-D for the A16B Tool side

A08A,A08B

Approach Sensor
13A×8 (MS connector)※3 ※5

Use D/MS3102A 18-1P for the A08A master side
Use D/MS3102A 18-1S for the A08A Tool side
Use D/MS3102A 18-19P for the A08B Master side
Use D/MS3102A 18-19S for the A08B Tool side

■Non-contact electric signal block

B15NA/B,B15PA/B(Master side only) B15DA/B (Tool side only)

B15NA/B NPN output
B15PA/B PNP output

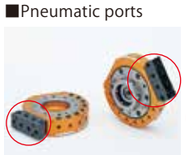
Receptacle connector: WE8R-21195-D for B15NA/B and B15PA/B
Receptacle connector: WE8R-21195-D for B15DA/B

■Ground

E50A,E50B

Ground 500A×1

■Pneumatic ports



P18A,P18B

Rc1/8×4

P14A,P14B

Rc1/4×2

P3WA,P3WB

Rc3/8×2

■Lock/unlock sensor

SA,SB

Two built-in proximity switches verify piston position, thus reliably checking the lock and unlock status.

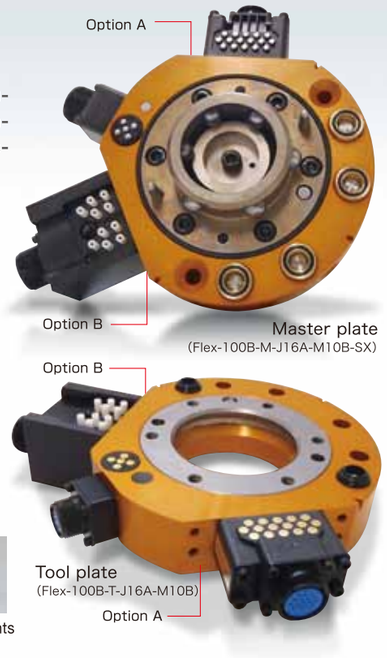
Please contact BL Autotec, Ltd. for detailed information on the options.

SA Type・・・The sensor plate can be used in place of an interface plate with modifications by the user
SB Type・・・The sensor plate can be used in place of an interface plate with modifications by BL Autotec ,Ltd.
※When you order the lock/unlock sensor please provide us with a drawing of the robot flange.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or the device is damaged. ※2 Plug connector is not included. Please prepare plug connector type 17JE-23150-02(D8A)-CG or compatible type. ※3 Plug connector is not included. Please prepare plug connector by customer. For connector, please see correspondence table on page 46. ※4 Allowable current is total 30.4A for connector. ※5 Allowable current is total 57.2A for connector. ※6 An option is available on the electric signal contact block (J16A, M10A, A16A, A08A) to connect the Lock/unlock proximity switch signal. Please contact us for additional information.

Flex-100B

The BL QUICK-CHANGE Model Flex-100B is a device for quick and accurate automatic changing of multiple end-effectors, such as material handling, palletizing and deburring. Pneumatic blocks and electrical connector blocks can be selected for the Flex-100B.



Heavy duty applications

For heavy duty applications, such as deburring, a special seal prevents dust from entering the locking mechanism and electrical contacts when the plates are coupled.

Self-sealing pneumatic ports

There are six pneumatic ports in the Master plate (Rc3/8) . Four of the six ports are self-sealing, which automatically shut off air pressure when uncoupled and allow for easier air control in the system.

Large misalignment correction capability

The unique design corrects misalignment when the Master and Tool plates couple. An approach sensor system, built into the plates, verifies coupling capability.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.

Master plate Attachments
·6 bolts(M8×55)
·Stepped parallel pin×1
※Seal plate, O-ring and screws are pre-assembled.

Specifications

Main Body

Load capacity (rated load)		980N(100kg)
Positional repeatability		±0.015mm
Allowable dynamic moment	Bending direction (Tx, Ty)	1,372N·m(140kgf·m)
	Twisting direction (Tz)	1,372N·m(140kgf·m)
Coupling force (with air pressure of 0.49MPa) ※1		10,290N(1,050kgf)
Materials	Frame	Aluminum alloy
	Lock/ unlock mechanism	Stainless steel
Overall dimension (when coupled)		ϕ178×H81.5mm
Weight (Main body)	Master plate	3,900g
	Tool plate	2,250g
Self-separating mechanism		Ball-locking mechanism
Required air pressure		0.39~0.68MPa(4~7kgf/cm²)
Allowable temperature and humidity ranges		0~50℃, 35~90%(Non-condensing)
Utilities	Electrical signals Max. 5 DC/AC200V Probe contact	5A×5 ※2
	Pneumatic ports	Rc3/8×4 (self-sealing) ※3
		Rc3/8×2
	Approach sensor	Senses Tool plate position up to 1.5mm distance

Option

Utilities	D15A. D15B	Electrical signals	3A×15 ※4
	J16A. J16B	Electrical signals	5A×16 ※2 ※5
	M10A. M10B	Electrical signals	13A×10 ※2 ※6
	B15NA B15NB B15PA B15PB	Electric signals Max.50mA DC24V Non-contact system (Please refer to page 41 for details.)	50mA×15 WEB series connector ※2 In Zone 1 IP67
	B15DA B15DB	Electric signals Max.5mA DC12V Non-contact system (Please refer to page 41 for details.)	5mA×15 WEB series connector ※2 IP67
	E50A. E50B	Ground	500A (50% usage) ×1
	P18A. P18B	Pneumatic ports	Rc1/8×4
	P14A. P14B	Pneumatic ports	Rc1/4×2
	P38A. P38B	Pneumatic ports	Rc3/8×4
	P3WA. P3WB	Pneumatic ports	Rc3/8×2
Lock/unlock sensor ※7			Two built-in proximity switches

Flex-100B Ordering Informatio

Master plate **Flex-100B -M-** (Option A) – (Option B) – (Lock/unlock sensor)

Tool plate **Flex-100B -T-** (Option A) – (Option B)

(Option A)		(Option B)	
XXXA	No electrical signal	XXXB	No option
D15A	Electrical signals 3A×15※4	D15B	Electrical signals 3A×15※4
J16A	Electrical signals 5A×16※2 ※5	J16B	Electrical signals 5A×16※2 ※5
M10A	Electrical signals 13A×10※2 ※6	M10B	Electrical signals 13A×10※2 ※6
B15NA	Non-contact electric signal block Master side NPN output	B15NB	Non-contact electric signal block Master side NPN output
B15PA	Non-contact electric signal block Master side PNP output	B15PB	Non-contact electric signal block Master side PNP output
B15DA	Non-contact electric signal block Tool side	B15DB	Non-contact electric signal block Tool side
◎ E50A	Ground 500A×1	◎ E50B	Ground 500A×1
P18A	Pneumatic ports Rc1/8×4	P18B	Pneumatic ports Rc1/8×4
P14A	Pneumatic ports Rc1/4×2	P14B	Pneumatic ports Rc1/4×2
P38A	Pneumatic ports Rc3/8×4	P38B	Pneumatic ports Rc3/8×4
P3WA	Pneumatic ports Rc3/8×2	P3WB	Pneumatic ports Rc3/8×2

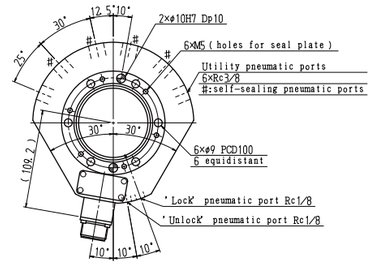
(Lock/unlock sensor)	
SX	No lock/unlock sensor
SA	Lock/unlock sensor A-Type (Customer processes the adaptor plate)
SB	Lock/unlock sensor B-Type (BL Autotec processes the adaptor plate)

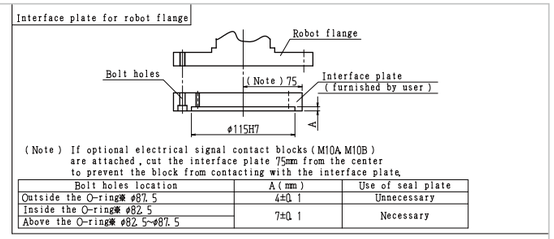
Note:◎Combination of E50A & E50B, cannot be used on the same Flex-100B.

We have Model: QCP-100A for material handling between presses. Please contact BL Autotec, Ltd. for further information.

※Flex-100B is interchangeable with the previous Flex-100A and Flex-100.

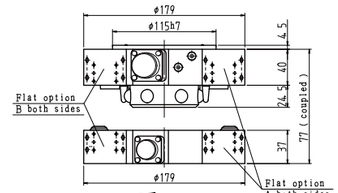
Main Body Dimensions

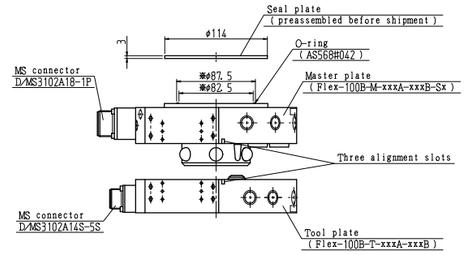


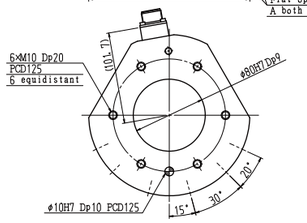


(Note) If optional electrical signal contact blocks (M10A M10B) are attached, cut the interface plate 75mm from the center to prevent the block from contacting with the interface plate.

Bolt holes location	A (mm)	Use of seal plate
Outside the O-ring※ ϕ87.5	4±0.1	Unnecessary
Inside the O-ring※ ϕ82.5	7±0.1	Necessary
Above the O-ring※ ϕ82.5~ϕ87.5		







(Model:Flex-100B-xxxA-xxxB-Sx)

●Six bolts (M8×55mm) and one locating pin (MSY10-30) are supplied with the Master plate.
●The six bolts extend 16.0mm above the Master plate (when seal plate attached).

Options

■Electrical signal contact block

D15A,D15B
3A×15 D-sub 15 contacts (female receptacles)※4
※Plug side is DDK. 17JE-23150-02(D8A) -CG or its equivalent.

J16A,J16B
5A×16 (JM connector)※2 ※5
Use JMR2116M-D for the J16A Master side
Use JMR2116F-D for the J16A Tool side
Use JMR2116MX-D for the J16B Master side
Use JMR2116FX-D for the J16B Tool side

M10A,M10B
13A×10 (MS connector)※2 ※6
Use D/MS3102A18-1P for the M10A Master side
Use D/MS3102A18-1S for the M10A Tool side
Use D/MS3102A18-19P for the M10B Master side
Use D/MS3102A18-19S for the M10B Tool side

■Non-contact electric signal block

B15NA/B,B15PA/B(Master side only)
B15DA/B(Tool side only)
B15NA/B NPN output
B15PA/B PNP output
Receptacle connector: WEBR-2119S-D for B15NA/B and B15PA/B
Receptacle connector: WEBR-2116F5-D for B15DA/B

■Ground

E50A,E50B
Ground 500A×1

■Pneumatic ports

P18A,P18B
Rc1/8×4

P14A,P14B
Rc1/4×2

P38A,P38B
Rc3/8×4

P3WA,P3WB
Rc3/8×2

■Lock/unlock sensor

SA,SB
Two built-in proximity switches verify piston position, thus reliably checking the lock and unlock status.

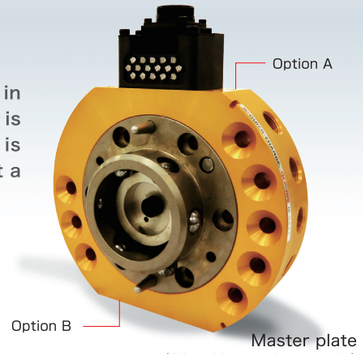
Please contact BL Autotec, Ltd. for detailed information on the options.

SA Type…The sensor plate can be used in place of an interface plate with modifications by the user
SB Type…The sensor plate can be used in place of an interface plate with modifications by BL Autotec ,Ltd.
※When you order the lock/unlock sensor please provide us with a drawing of the robot flange.

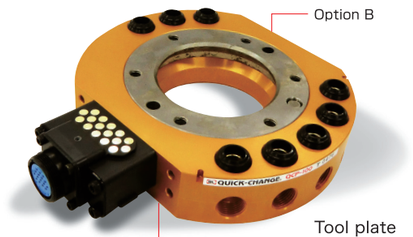
※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or the device is damaged. ※2 Plug connector is not included. Please prepare plug connector by customer. For connector, please see correspondence table on page 51. ※3 Port with self-sealing of pneumatic ports cannot be used for vacuum. ※4 Plug connector is not included. Please prepare plug connector type 17JE-23150-02(D8A)-CG or compatible type. ※5 Allowable current is total 30.4A for connector. ※6 Allowable current is total 57.2A for connector. ※7 An option is available on the electric signal contact block (D/MS3102A18-1P) to connect the Lock/unlock proximity switch signal. Please contact us for additional information.

QCP-100A

The BL QUICK-CHANGE Model QCP-100 is an automatic tool changer used in press handling applications for switching part-adsorption end-effectors. It is easy to set up ID confirmation on the Tool plate side, and the block itself is equipped with a protective cover. An electrical signal contact block without a connector on the tool side is available as an option.



Master plate
(QCP-100A-M-J16A-XXXB-SX)



Tool plate
(QCP-100A-T-J16A-XXXB)

Body designed specially for press applications

Both sides of the Tool plate are cut, which allows it to be placed in an upright position, requiring less space for hand installation.

Utilities specially considered for press applications

Eight pneumatic vacuum ports are included on standard equipment, and the QCP-100 can be optionally equipped with up to 16 ports. The Tool plate has an optional electrical signal block contact without a connector (R16A/B). Directly-soldered hard-wiring makes a plug unnecessary, so it cannot be damaged when hands are exchanged. It is easy to assign ID discrimination in the hard-wiring section, and the block itself is protected by a metal cover.

Capability to assign power signals to the lock/unlock sensor from the electrical signal contact block

Two types of power signals may be assigned to the lock/unlock sensor (optional) from the electrical signal contact block.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master plate and Tool plate to uncouple if the air pressure is shut off.

Master plate Attachments
- 6 bolts(M8×55)
- 1 locating pin

※Seal plate, O-ring and screws are pre-assembled.

Specifications

Main Body		
Load capacity (rated load)		980N(100kg)
Positional repeatability		±0.015mm
Allowable dynamic moment	Bending direction (Tx, Ty)	1,372N·m(140kgf·m)
	Twisting direction (Tz)	1,372N·m(140kgf·m)
Coupling force (with air pressure of 0.49Mpa) ※1		10,290N(1,050kgf)
Materials	Frame	Aluminum alloy
	Lock/ unlock mechanism	Stainless steel
Overall dimension (when coupled)		φ179×H79.5mm
Weight (Main body)	Master plate	3.5kg
	Tool plate	2.0kg
Self-separating mechanism		Ball-locking mechanism
Required air pressure		0.39~0.68MPa(4~7kgf/cm²)
Allowable temperature and humidity ranges		0~50℃, 35~90%(Non-condensing)
Utilities	Pneumatic ports	Rc3/8×8

Options			
Utilities	J16A. J16B	Electrical signals	5A×16 ※2 ※6
	M10A. M10B	Electrical signals	13A×10 ※2 ※7
	L16A	Electrical signals	5A×16 + lock/unlock signals ×3 (Master side only) ※2 ※3 ※6
	L07A	Electrical signals	13A×7 + lock/unlock signals ×3 (Master side only) ※2 ※4 ※7
	R16A. R16B	Electrical signals	5A×16 (Tool side only. An electrical signal contact block without a connector specification) ※5 ※6
	B15NA B15NB B15PA B15PB	Electric signals Max.50mA DC24V Non-contact system (Please refer to page 41 for details.)	50mA×15 WEB series connector ※2 In Zone 1 IP67
	B15DA B15DB	Electric signals Max.5mA DC12V Non-contact system (Please refer to page 41 for details.)	5mA×15 WEB series connector ※2 IP67
	P38A. P38B	Pneumatic ports	Rc3/8×4
Lock/unlock sensor			Two built-in proximity switches

QCP-100A Ordering Information

Master plate QCP-100A-M- □□□□ – (Option A) □□□□ – (Option B) □□□□ – (lock unlock sensor) □□

(Option A)

XXXA	No option
J16A	Electrical signals 5A×16※2 ※6 ※8
M10A	Electrical signals 13A×10※2 ※7
L16A	Electrical signals 5A×6 (Three separately assigned lock/unlock signals) ※2 ※3 ※6 ※9
L07A	Electrical signals 13A×7 (Three separately assigned lock/unlock signals) ※2 ※4 ※7 ※10
B15NA	Non-contact electric signal block Master side NPN output
B15PA	Non-contact electric signal block Master side PNP output
P38A	Pneumatic ports Rc3/ 8×4

(Option B)

XXXB	No option
J16B	Electrical signals 5A×16※2 ※6 ※11
M10B	Electrical signals 13A×10※2 ※7
B15NB	Non-contact electric signal block Master side NPN output
B15PB	Non-contact electric signal block Master side PNP output
P38B	Pneumatic ports Rc3/8×4

(lock unlock sensor)

SX	No lock/unlock sensor
SA	Lock/unlock sensor A-Type (Customer processes the adaptor plate)
SB	Lock/unlock sensor B-Type (BL Autotec processes the adaptor plate)

Tool plate QCP-100A-T- □□□□ – (Option A) □□□□ – (Option B) □□□□

(Option A)

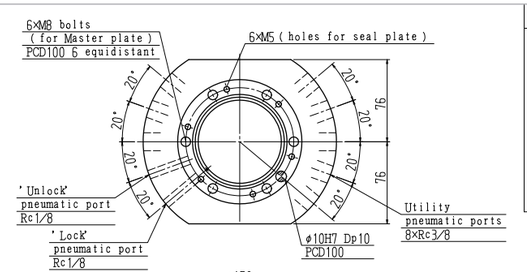
XXXA	No option
J16A	Electrical signals 5A×16※2 ※6
R16A	Electrical signals 5A×16※5 ※6 (without a connector)
M10A	Electrical signals 13A×10※2 ※7 ※12
B15DA	Non-contact electric signal block Tool side
P38A	Pneumatic ports Rc3/8×4

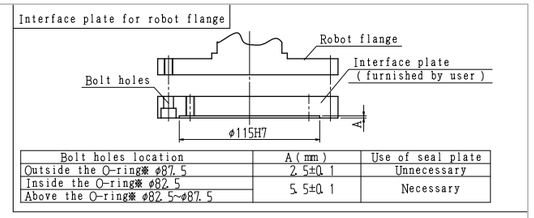
(Option B)

XXXB	No option
J16B	Electrical signals 5A×16※2 ※6
R16B	Electrical signals 5A×16※5 ※6 (without a connector)
M10B	Electrical signals 13A×10※2 ※7
B15DB	Non-contact electric signal block Tool side
P38B	Pneumatic ports Rc3/8×4

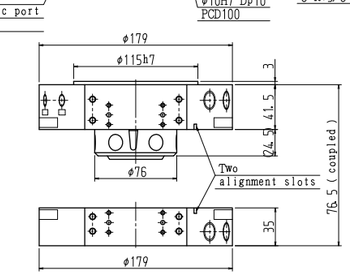
Please contact us about compatibility with customized models QC-100 and QC-100A.

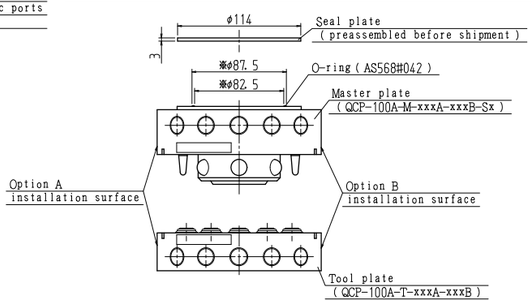
Main Body Dimensions

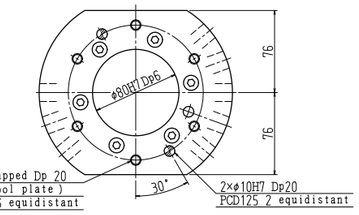




Bolt holes location	A (mm)	Use of seal plate
Outside the O-ring※ φ87.5	2.5±0.1	Unnecessary
Inside the O-ring※ φ82.5 Above the O-ring※ φ82.5~φ87.5	5.5±0.1	Necessary







●Six bolts (M8×55mm) and one locating pin (MSY10-30) are supplied with the Master plate.
●The six bolts extend 16.1mm above the Master plat (when seal plate attached).

(Model:QCP-100A-xxxA-xxxB-Sx)

Options

■Electrical signal contact block

J16A,J16B

5A×16 (J16A·B)※2 ※6

Use JMR2116M-D (DDK) for the J16A Master side
Use JMR2116F-D (DDK) for the J16A Tool side
Use JMR2116MX-D (DDK) for the J16B Master side
Use JMR2116FX-D (DDK) for the J16B Tool side
Use JMR2119M-D (DDK) for the J16A Master side

M10A,M10B,L07A (Master side only)

13A×10 (M10A·B)※2 ※7
13A×7+lock/unlock signals (L07A)※2 ※4 ※7

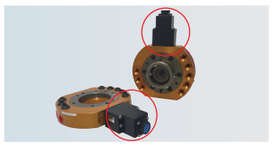
Use D/MS3102A18-1P for the M10A and L07A Master side
Use D/MS3102A18-1S for the M10B Tool side
Use D/MS3102A18-19P for the M10B Master side
Use D/MS3102A18-19S for the M10B Tool side
(Use RoHS-compliant MS receptacle products)

R16A,R16B (Tool side only)

5A×16 (without a connector)※5 ※6

Please solder the hard-wiring (Please use J16A, J16B or L16A for the Master side)

■Non-contact electric signal block

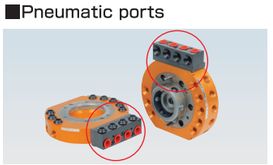


B15NA/B,B15PA/B(Master side only)
B15DA/B (Tool side only)

B15NA/B NPN output
B15PA/B PNP output

Receptacle connector: WEBR-2119S-D for B15NA/B and B15PA/B
Receptacle connector: WEBR-2116FS-D for B15DA/B

■Pneumatic ports



P38A,P38B

Rc3/8×4

■Lock/unlock sensor

SA,SB

Two built-in proximity switches verify piston position on and lock/ unlock status.

Please contact us for detailed information on the options.

SA Type…The sensor plate can be used in place of an interface plate with modifications by the user
SB Type…The sensor plate can be used in place of an interface plate with modifications by BL Autotec ,Ltd.
※When you order the lock/unlock sensor please provide us with a drawing of the robot flange.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or the device is damaged. ※2 Plug connector is not included. Please prepare plug connector by customer. For connector, please see correspondence table on page 46. Please use 5A × 16 electrical signal contacts (J16A or R16A) on the tool side. ※4 Please use 13A × 10 electrical signal contacts (MS coneccter (Three of the 10 contacts are not useable) ※5 Please use 5A × 16 electrical signal contacts (J16A or R16A) on the master side. ※6 Allowable current is total 30.4A for connector. ※7 Allowable current is total 57.2A for connector. ※8 Please select J16A or R16A for the tool side. ※9 Lock/unlock Sensor SA or SA may be selected for L16A. The receptacle connector is type JMR2119F (19 pins). Please select contact block J16A or R16A for the tool side. ※10 Lock/unlock Sensor SA or SA may be selected for L07A. The receptacle connector is D/MS3102A-1P (10 pins). Please select contact block M10A for the tool side. ※11 Please select electric signal contact block J16B or R16B for the tool side. ※12 Up to seven electric signals may be used when L07A is selected for the master side.

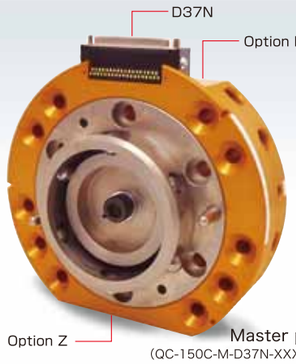
QC-150C

Lock without touching

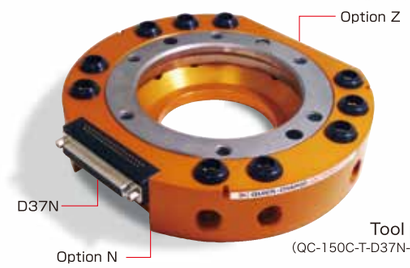
The Master plate can lock onto the Tool plate with a gap between them.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.



Master plate
(QC-150C-M-D37N-XXXZ-SX)



Tool plate
(QC-150C-T-D37N-XXXZ)

Master plate Attachments
・6 bolts (M10×60)
・1 locating pin
※Seal plate, O-ring and screws are pre-assembled.

Specifications

Main Body

Load capacity (rated load)		1,470N(150kg)
Positional repeatability		±0.015mm
Allowable dynamic moment	Bending direction (Tx, Ty)	1,960N・m(200kgf・m)
	Twisting direction (Tz)	1,960N・m(200kgf・m)
Coupling force (with air pressure of 0.49MPa) ※1		14,317N(1,460kgf)
Materials	Frame	Anodized aliminum
	Lock/unlock mechanism	Stainless steel
Overall domension (when coupled)		ϕ200×H90mm
Weight (Main body)	Master plate	5,810g
	Tool plate	2,860g
Self-separating mechanism		Ball-locking mechanism
Required air pressure		0.39～0.68MPa(4～7kgf/cm²)
Allowable temperature and humidity ranges		0～50℃、35～90%(Non-condensing)
Utilities	Electical signals Max3 AC50V Probe contact	3A×37 or none ※2
	Pneumatic ports	Rc3/8×10

Options

	D37Z	Electical signals	3A×37 ※2
	J16Z	Electical signals	5A×16 ※3 ※4
	M10Z	Electical signals	13A×10 ※3 ※5
	M19Z	Electical signals	13A×19 ※3 ※6
	A16Z	Electical signals	Approach sensor+5A×16 ※3 ※4
	A08Z	Electical signals	Approach sensor+13A×8 ※3 ※5
Utilities	B15NZ B15PZ	Electric signals Max.50mA DC24V Non-contact system (Please refer to page 41 for details.)	50mA×15 WEB series connector ※3 In Zone 1 IP67
	B15DZ	Electric signals Max.5mA DC12V Non-contact system (Please refer to page 41 for details.)	5mA×15 WEB series connector ※3 IP67
	E50Z	Ground	500A (50% usage) ×1
	P18Z	Pneumatic ports	Rc1/8×4
	P14Z	Pneumatic ports	Rc1/4×2
	P38Z	Pneumatic ports	Rc3/8×4
	P3WZ	Pneumatic ports	Rc3/8×2
Lock/unlock sensor ※7			Two built-in proximity switches

QC-150C Ordering Information

Master plate **QC-150C -M-** (Option N) □□□□ – (Option Z) □□□□ – (lock unlock sensor) □□

Tool plate **QC-150C -T-** (Option N) □□□□ – (Option Z) □□□□

(Option N)	
DXXN	No electrical signal
D37N	Electrical signals 3A×37※2

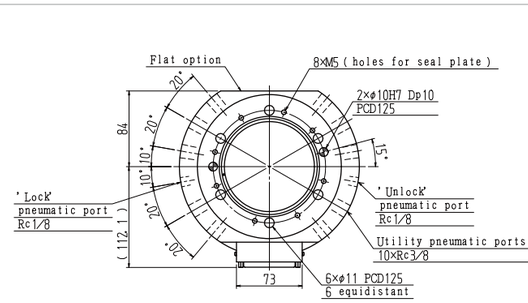
(Option Z)	
XXXZ	No option
D37Z	Electrical signals 3A×37※2
J16Z	Electrical signals 3A×16※3 ※4
M10Z	Electrical signals 13A×10※3 ※5
M19Z	Electrical signals 13A×19※3 ※6
A16Z	Approch sensors +Electrical signals 5A×16※3 ※4
A08Z	Approch sensors +Electrical signals 13A×8※3 ※5
B15NZ	Non-contact electric signal block Master side NPN output
B15PZ	Non-contact electric signal block Master side PNP output
B15DZ	Non-contact electric signal block Tool side
E50Z	Ground 500A×1
P18Z	Pneumatic ports Rc1/8×4
P14Z	Pneumatic ports Rc1/4×3
P38Z	Pneumatic ports Rc3/3×4
P3WZ	Pneumatic ports Rc3/8×2

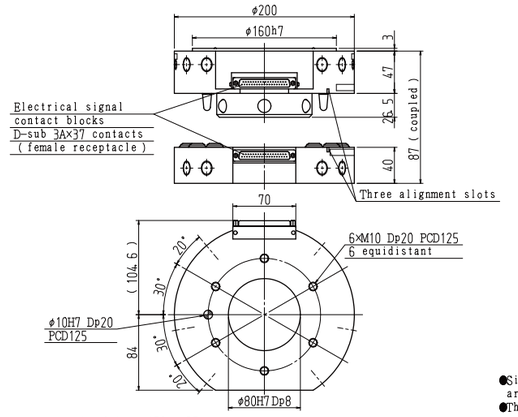
(lock unlock sensor)	
SX	No lock/unlock sesor
SA	Lock/unlock sensor A-Type (Customers processes the adaptor plate)
SB	Lock/unlock sensor B-Type (BL.Autotec processes the adaptor plate)

(Note) Please provide specifics on the electric signal contact block as follows.
(Model D37N-M for master plate, Model D37N-T for Tool plate).

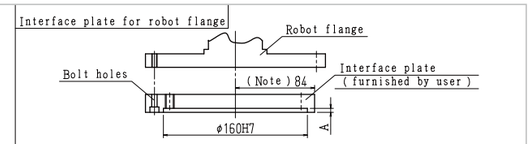
※QC-150C is interchangeable with the previous QC-150B and QC-150A.

Main Body Dimensions



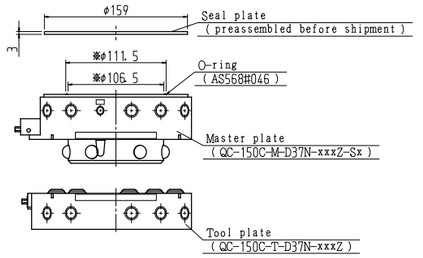


(Model:QC-150C-D37N-xxxZ-Sx)



(Note) If optional electrical signal contact blocks (M10A, M10B) are attached, cut the interface plate 84mm from the center to prevent the block from contacting with the interface plate.

Bolt holes location	A (mm)	Use of seal plate
Outside the O-ring※ ϕ111.5	2.5±0.1	Unnecessary
Inside the O-ring※ ϕ106.5	5.5±0.1	Necessary
Above the O-ring※ ϕ106.5～ϕ111.5		



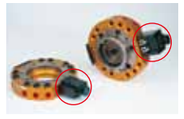
●Six bolts (M10×60mm) and one locating pin (MSY10-30) are supplied with the Master plate.
●The six bolts extend 17.8mm above the Master plate (when seal plate attached).

Options

■Electrical signal contact block

D37Z
3A×37 D-sub 37 contacts (female receptacles)※2
※Plug side is DDK, 17 JE-23370-02 (D8A) -CG, or its equivalent.

J16Z
5A×16 (JM connector)※3 ※4
Use JMR2116M-D for the J16Z Master side
Use JMR2116F-D for the J16Z Tool side



M10Z
13A×10 (MS connector)※3 ※5
Use D/MS3102A18-1P for the M10Z Master side
Use D/MS3102A18-1S for the M10Z Tool side

M19Z
13A×19 (MS connector)※3 ※6
Use D/MS3102A22-14P for the M19Y Master side
Use D/MS3102A22-14S for the M19Y Tool side

A16Z
Approach Sensor 5A×16 (JM connector)※3 ※4
Use JMR2119M-D for the A16Z Master side
Use JMR2119F-D for the A16Z Tool side

A08Z
Approach Sensor 13A×8 (MS connector)※3 ※5
Use D/MS3102A18-1P for theA08Z Master side
Use D/MS3102A18-1S for the A08Z Tool side

■Non-contact electric signal block

B15NZ,B15PZ
B15DZ(Tool side only)
B15NZ NPN output
B15PZ PNP output
Receptacle connector: WEBR-2119S-D for B15NZ and B15PZ
Receptacle connector: WEBR-2116FS-D for B15DZ

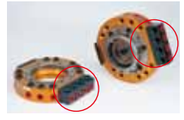
■Ground

E50Z
Ground 500A×1

■Pneumatic ports

P18Z
Rc1/8×4

P14Z
Rc1/4×2



P38Z
Rc3/8×4

P3WZ
Rc3/8×2

■ Lock/unlock sensor

SA,SB
Two built-in proximity switches verify piston position, thus reliably checking the lock and unlock status.

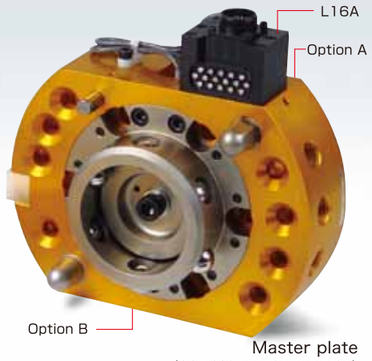
Please contact BL Autotec, Ltd.
for detailed information on the options.

SA Type…The sensor plate can be used in place of an interface plate with modifications by the user
SB Type…The sensor plate can be used in place of an interface plate with modifications by BL Autotec ,Ltd.
※When you order the lock/unlock sensor please provide us with a drawing of the robot flange.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or the device is damaged. ※2 Plug connector is not included. Please prepare plug connector type 17JE-23150-02(D8A)-CG or compatible type. ※3 Plug connector is not included. Please prepare plug connector by customer. For connector, please see correspondence table on page 46. ※4 Allowable current is total 30.4A for connector. ※5 Allowable current is total 57.2A for connector. ※6 Allowable current is total 88.9AA for connector. ※3 Allowable current is total 30.4A for connector. ※4 Allowable current is total 57.2A for connector.

QCP-220

The BL QUICK-CHANGE Model QCP-220 is an automatic end-effector changer used in press handling and loading applications, with a payload capacity of 200kg for large panels and high-speed robots. It can be directly installed on a PCD125 mm robot flange.



Master plate
(QCP-220-M-L16A-XXXB-SA)

Utilities specifically for press applications

Pneumatic ports (Rc1/2) can be used for vacuum pressure and electrical signals can be used for ID confirmation.

Built-in lock/unlock sensor

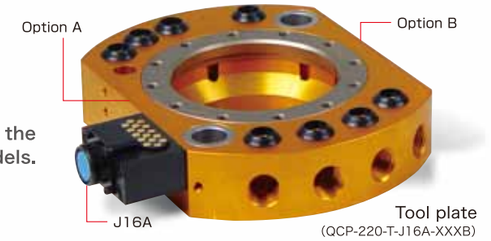
Due to built-in design, QCP-220 is 12.4% thinner than QC-150C with the lock/unlock sensor.

Faster lock/unlock operation

By enlarging the lock/unlock port diameter, we increased the lock/unlock speed by 50% compared with previous models. (In-house comparison.)

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.



Tool plate
(QCP-220-T-J16A-XXXB)

Master plate Attachments
- 6 bolts (M10×65)
- 6 plain washers
- 1 locating pin

Specifications

Main Body

Load capacity (rated load)		2,156N(220kg)
Positional repeatability		±0.025mm
Allowable dynamic moment	Bending direction (Tx, Ty)	3,332N·m(340kgf·m)
	Twisting direction (Tz)	3,332N·m(340kgf·m)
Coupling force (at 0.49Mpa air pressure) ※1		27,444N(2,800kgf)
Materials	Frame	Aluminum alloy
	Lock/ unlock mechanism	Stainless steel
Overall dimension (when coupled)		ϕ229×H110mm
Weight (Main body)	Master plate	8.4kg
	Tool plate	3.6kg
Lock/ unlock mechanism		Ball-locking mechanism
Required operating air pressure		0.39~0.68MPa(4~7kgf/cm²)
Lock/unlock sensor	Lock status	1built-in proximity switch E2E-X2D1-N(OMRON)(2-wrie direct current)
	Unlock status	1built-in proximity switch E2E-X2D1-N(OMRON)(2-wrie direct current)
Allowable temperature and humidity ranges		0~50℃、35~90%(Non-condensing)
Utilities	Electrical signals	5A×16 (There are 19 lock/unlock receptacles on the Master plate side) ※2
	Pneumatic ports	Rc1/2×8 (can use vacuum pressure)

Options

Utilities	J16A J16B	Electrical signals	5A×16 ※2 ※3
	L16A	Electrical signals	5A×16 ※2 ※3 ※5
	M10B	Electrical signals	13A×10 ※2 ※4
	B15NB B15PB	Electric signals Max.50mA DC24V Non-contact system (Please refer to page 41 for details.)	50mA×15 WEB series connector ※2 In Zone 1 IP67
	B15DB	Electric signals Max.5mA DC12V Non-contact system (Please refer to page 41 for details.)	5mA×15 WEB series connector ※2 IP67
	P3WB	Pneumatic ports	Rc3/8×4
	P38B	Pneumatic ports	Rc3/8×2

Master plate QCP-220 -M- □□□□ – (Option A) □□□□ – (Option B) □□□□ (lock unlock sensor) □□

(Option A)	
XXXA	No electrical signal
L16A	Electrical signals 5A×16※2 ※3

(Option B)	
XXXB	No option
J16B	Electrical signals 5A×16※2 ※3
L16A	Electrical signals Master side 5A×16※2 ※3
M10B	Electrical signals 13A×10※2 ※4
B15NB	Non-contact electric signal block Master side NPN output
B15PB	Non-contact electric signal block Master side PNP output
P38B	Pneumatic ports Rc3/8×4
P3WB	Pneumatic ports Rc3/8×2

Note) "Option" is installed at B side only.

(lock unlock sensor)	
SX	No lock/unlock sensor
SA	Built-in lock/unlock sensor

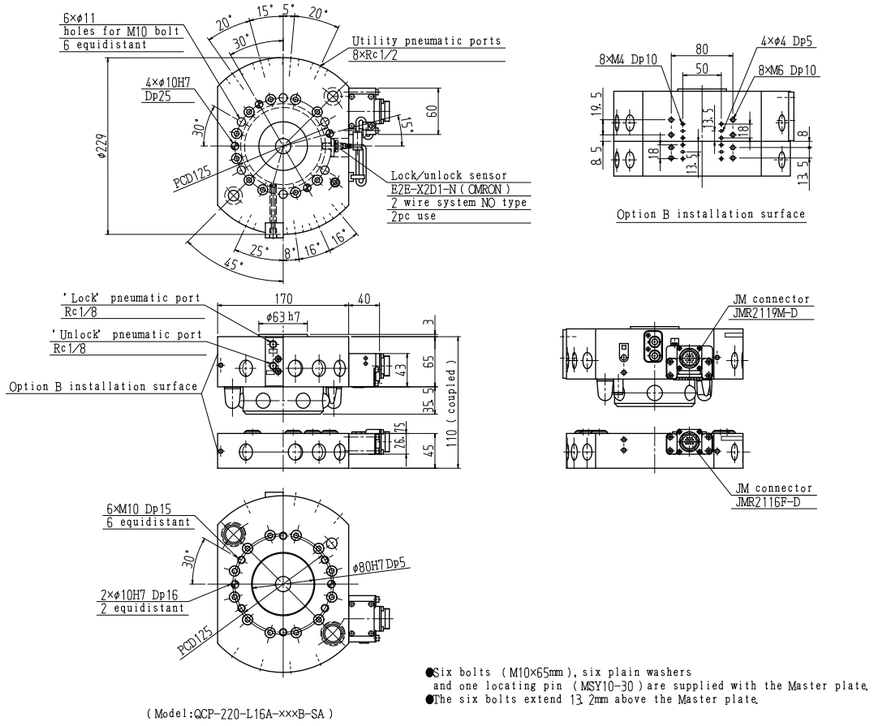
Note) If "SX" type is selected. "XXXA" is automatically provided.

Tool plate QCP-220 -T- □□□□ – (Option A) □□□□ – (Option B) □□

(Option A)	
XXXA	No electrical signal
J16A	Electrical signals 5A×16※2 ※3

(Option B)	
B15DB	Non-contact electric signal block Tool side

Main Body Dimensions



(Model:QCP-220-L16A-×××B-SA)

●Six bolts (M10×65mm), six plain washers and one locating pin (MSY10-30) are supplied with the Master plate.
●The six bolts extend 13.2mm above the Master plate.

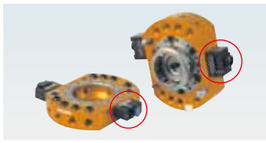
Options

■Electrical signal contact block

L16A(Master side only) ※5
J16A(Tool side only)

5A×16 (JM connector)※2 ※3

Use JMR2119M-D for the L16A on the Master side
Use JMR2116M-D for the J16A on the Master side
Use JMR2116F-D for the J16A on the Tool side



J16B

5A×16 (JM connector)※2 ※3

Use JMR2116MX-D for the J16B on the Master side
Use JMR2116FX-D for the J16B on the Tool side

■Non-contact electric signal block

M10B

13A×10 (MS connector)※2 ※4

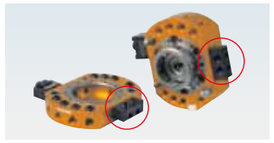
Use D/ MS3102A18-9P on the Master side of M10B
Use D/ MS3102A18-19S on the Tool side of M10B
(Use RoHS-complant MS receptacle products.)

B15NB,B15PB(Master side only)
B15DB(Tool side only)

B15NB NPN output
B15PB PNP output

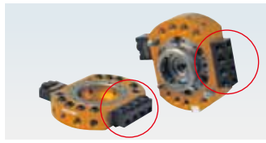
Receptacle connector: WEBR-2119S-D for B15NB and B15PB
Receptacle connector: WEBR-2116FS-D for B15DB

■Pneumatic pressure ports



P3WB

Rc3/8×2



P38B

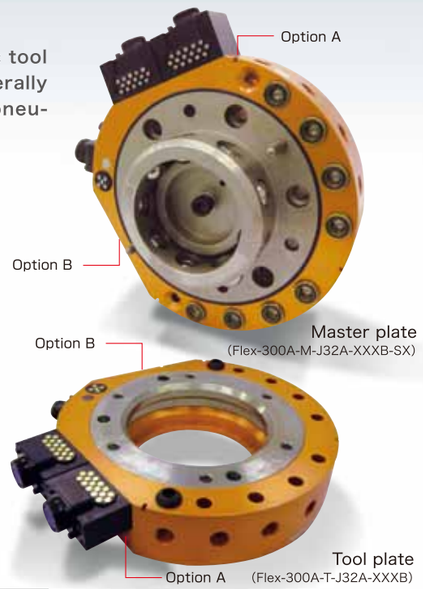
Rc3/8×4

Please contact us for detailed information on the options.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or the device is damaged. ※2 Plug connector is not included. Please prepare plug connector by customer. For connector, please see correspondence table on page 46. ※3 Allowable current is total 30.4A for connector. ※4 Allowable current is total 57.2A for connector. ※5 Standard lock/unlock sensor is NPN. Please ask us if you request PNP system.

Flex-300A

The BL QUICK-CHANGE Model Flex-300A is a device for automatic tool changing, specially designed for high payload capacity robots generally used in handling and palletizing. Optional electrical contacts or pneumatic ports can be selected for the Flex-300A.



Heavy duty applications

For heavy duty applications, a special seal prevents dust from entering the locking mechanism and electrical contacts when the two plates are coupled. (Load Capacity: 300kg/Allowable static moment (Tx, Ty) :270kgf･m)

Self-sealing pneumatic ports

There are ten pneumatic ports in the Master plate (Rc3/8). Eight of the ten ports are self-sealing, which automatically shut off air pressure when uncoupled and allow for easier air control in the system.

Large misalignment correction capability

The unique design corrects misalignment when the Master and Tool plates couple. An approach sensor system, built into the plates, verifies coupling capability.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.

Master plate Attachments
･6 bolts(M12×70)
･1 locating pin
※Seal plate, O-ring and screws are pre-assembled.

Specifications

Main Body

Load capacity (rated load)		2,940N(300kg)
Positional repeatability		±0.025mm
Allowable dynamic moment	Bending direction (Tx, Ty)	5,292N･m(540kgf･m)
	Twisting direction (Tz)	4,704N･m(480kgf･m)
Coupling force (with air pressure of 0.49MPa) ※1		31,360N(3,200kgf)
Materials	Frame	Aluminum alloy
	Lock/ unlock mechanism	Stainless steel
Overall dimension (when coupled)		φ259×H116mm
Weight (Main body)	Master plate	13.2kg
	Tool plate	7.2kg
Self-separating mechanism		Ball-locking mechanism
Required air pressure		0.39~0.68MPa(4~7kgf/cm²)
Allowable temperature and humidity ranges		0~50℃, 35~90%(Non-condensing)
Utilities	Electrical signals Max. 5 DC/AC200V Probe contact	5A×5 ※2
	Pneumatic ports	Rc3/8×8 (self-sealing) ※3
		Rc3/8×2
	Approach sensor	Senses Tool plate position up to 2.5mm distance

Options

Utilities	J16A. J16B	Electrical signals	5A×16 ※2 ※4
	J32A. J32B	Electrical signals	5A×32 ※2 ※4
	M10A. M10B	Electrical signals	13A×10 ※2 ※5
	M20A. M20B	Electrical signals	13A×20 ※2 ※5
	B15NA B15NB B15PA B15PB	Electric signals Max.50mA DC24V Non-contact system (Please refer to page 41 for details.)	50mA×15 WEB series connector ※2 インゾーン 1 IP67
	B15DA B15DB	Electric signals Max.5mA DC12V Non-contact system (Please refer to page 41 for details.)	5mA×15 WEB series connector ※2 IP67
	E50A. E50B	Ground	500A (50% usage) ×1
	P18A. P18B	Pneumatic ports	Rc1/8×4
	P14A. P14B	Pneumatic ports	Rc1/4×2
	P38A. P38B	Pneumatic ports	Rc3/8×4
	P3WA. P3WB	Pneumatic ports	Rc3/8×2
Lock/unlock sensor ※6			Two built-in proximity switche

Flex-300A Ordering Information

Master plate **Flex-300A-M-** (Option A) – (Option B) – (lock unlock sensor)

Tool plate **Flex-300A-T-** (Option A) – (Option B)

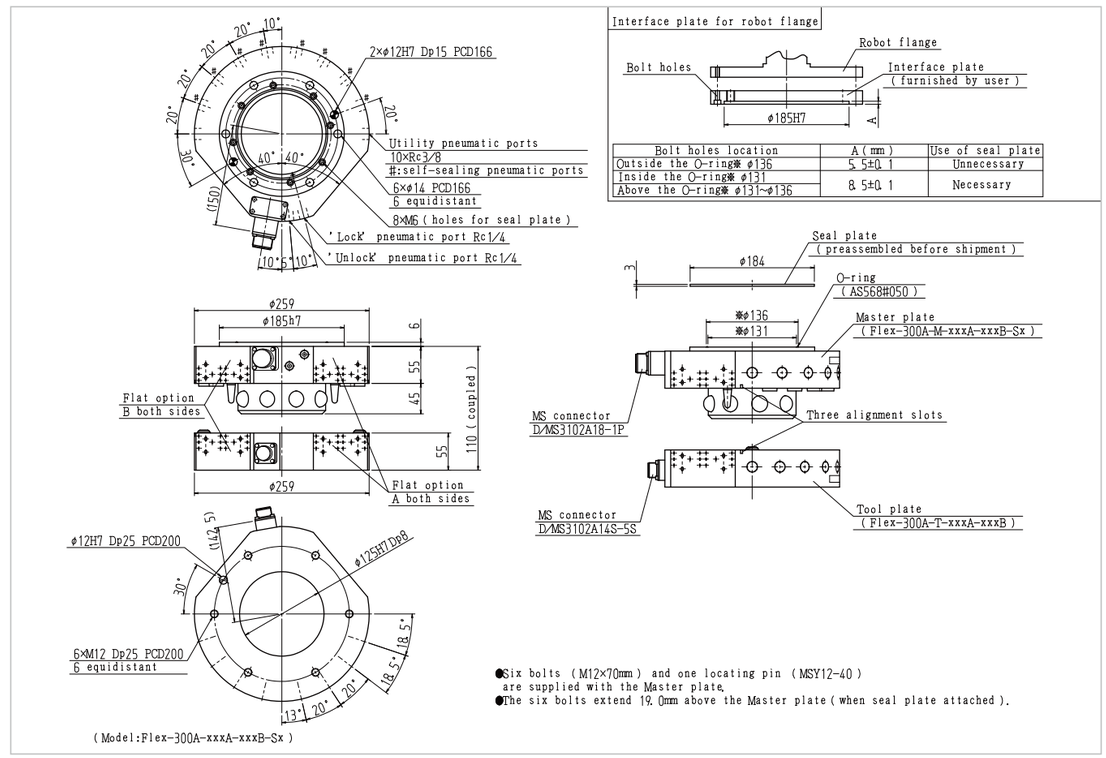
XXXA	No option
J16A	Electrical signals 5A×16※2 ※4
J32A	Electrical signals 5A×32※2 ※4
M10A	Electrical signals 13A×10※2 ※5
M20A	Electrical signals 13A×20※2 ※5
B15NA	Non-contact electric signal block Master side NPN output
B15PA	Non-contact electric signal block Master side PNP output
B15DA	Non-contact electric signal block Tool side
E50A	Ground 500A×1
P18A	Pneumatic ports Rc1/8×4
P14A	Pneumatic ports Rc1/4×2
P38A	Pneumatic ports Rc3/8×4
P3WA	Pneumatic ports Rc3/8×2

XXXB	No option
J16B	Electrical signals 5A×16※2 ※4
J32B	Electrical signals 5A×32※2 ※4
M10B	Electrical signals 13A×10※2 ※5
M20B	Electrical signals 13A×20※2 ※5
B15NB	Non-contact electric signal block Master side NPN output
B15PB	Non-contact electric signal block Master side PNP output
B15DB	Non-contact electric signal block Tool side
E50B	Ground 500A×1
P18B	Pneumatic ports Rc1/8×4
P14B	Pneumatic ports Rc1/4×2
P38B	Pneumatic ports Rc3/8×4
P3WB	Pneumatic ports Rc3/8×2

SX	No lock/unlock sensor
SA	Lock/unlock sensor A-Type (Customer processes the adaptor plate)
SB	Lock/unlock sensor B-Type (BL Autotec processes the adaptor plate)

※Flex-300A is interchangeable with the previous Flex-300.

Main Body Dimensions



●Six bolts (M12×70mm) and one locating pin (MSY12-40) are supplied with the Master plate.
●The six bolts extend 19.0mm above the Master plate (when seal plate attached).

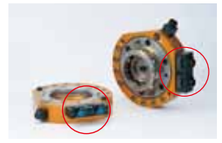
Options

■Electrical signal contact block

J16A,J16B

5A×16 (JM connector)※2 ※4

Use JMR2116M-D for the J16A Master side
Use JMR2116F-D for the J16A Tool side
Use JMR2116MX-D for the J16B Master side
Use JMR2116FX-D for the J16B Tool side



J32A,J32B

5A×32 (JM connector)※2 ※4

Use two JMR2116M-D for the J32A Master side
Use two JMR2116F-D for the J32A Tool side
Use two JMR2116MX-D for the J32B Master side
Use two JMR2116FX-D for the J32B Tool side

M10A,M10B

13A×10 (MS connector)※2 ※5

Use two D/MS3102A18-1P for the M10A Master side
Use two D/MS3102A18-1S for the M10A Tool side
Use two D/MS3102A18-19P for the M10B Master side
Use two D/MS3102A18-19S for the M10B Tool side

M20A,M20B

13A×20 (MS connector)※2 ※5

Use two D/MS3102A18-1P for the M20A Master side
Use two D/MS3102A18-1S for the M20A Tool side
Use two D/MS3102A18-19P for the M20B Master side
Use two D/MS3102A18-19S for the M20B Tool side

■Non-contact electric signal block

B15NA/B,B15PA/B(Master side only)
B15DA/B(Tool side only)

B15NA/B NPN output
B15PA/B PNP output

Receptacle connector: WEBR-2119S-D for B15NA/B and B15PA/B
Receptacle connector: WEBR-2116FS-D for B15DA/B

■Ground

E50A,E50B

Ground 500A×1

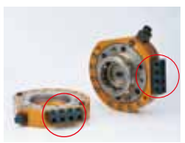
■Pneumatic ports

P18A,P18B

Rc1/8×4

P14A,P14B

Rc1/4×2



P38A,P38B

Rc3/8×4

P3WA,P3WB

Rc3/8×2

■Lock/unlock sensor

SA,SB

Two built-in proximity switches verify piston position, thus reliably checking the lock and unlock status.

Please contact BL Autotec, Ltd. for detailed information on the options.

SA Type…The sensor plate can be used in place of an interface plate with modifications by the user
SB Type…The sensor plate can be used in place of an interface plate with modifications by BL Autotec ,Ltd.
※When you order the lock/unlock sensor please provide us with a drawing of the robot flange.

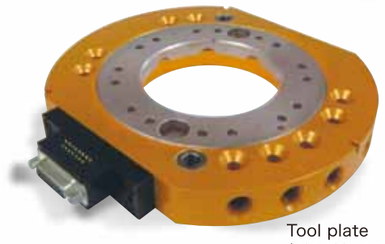
※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or the device is damaged. ※3 Plug connector is not included. Please prepare plug connector by customer. For connector, please see correspondence table on page 46. ※3 Allowable current is total 30.4A for connector. ※4 Allowable current is total 57.2A for connector. ※5 The two built-in proximity switch signals of the lock/unlock sensor can be assigned to the MS connector (D/MS3102A18-1P) of the main body. Please contact BL Autotec, Ltd. for further information.

Slimline Press Handling Specification

USP-100A

The BL QUICK-CHANGE Model USP-100A is a thin-shaped automatic end-effector changer designed to handle the high-speed conveyance of press parts. The thin design allows end-effectors on the parallel displacement arm to work on molding applications in press processes. Even if the opening is narrow, press parts can be conveyed without changing direction. (Japan Patent No. 3717923)

Master plate
(USP-100A-M-DI5U)



Tool plate
(USP-100A-T-DI5U)

Slimline design

BL's unique lock/unlock mechanism was newly designed to this specification, with a thickness of only 50mm when coupled, so it can handle narrow press openings.

Built-in position confirmation sensor

The built-in position confirmation sensor is equipped with a proximity switch.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master plate and Tool plate to uncouple if the air pressure is shut off.

Master plate Attachments
・8 bolts (M8×30)
・2 locating pins (MSY8-20)
※Seal plate, O-ring and screws are pre-assembled.

Specifications

Main Body

Load capacity (rated load)		980N (100kg)
Positional repeatability		±0.025mm
Allowable dynamic moment	Bending direction (Tx, Ty)	980N・m (100kgf・m)
	Twisting direction (Tz)	980N・m (100kgf・m)
Coupling force (with air pressure of 0.49Mpa) ※1		12,740N (1,300kgf)
Materials	Frame	Aluminum alloy
	Lock/unlock mechanism	Stainless steel
Overall dimension (when coupled)		φ189×H50mm
Weight (Main body)	Master plate	3.0kg
	Tool plate	1.7kg
Self-separating mechanism		Ball-locking mechanism
Required operating air pressure		0.39～0.68MPa (4～7kgf/cm²)
Position-confirming sensor		1 built-in proximity switch E2E-X2DI-N (OMRON) 1m sensor cable (lead wire)
Allowable temperature and humidity ranges		0～50℃、35～90% (Non-condensing)
Utilities	Pneumatic ports	Rc1/4×9 (can use vacuum pressure)

Options

Utilities	D15U	Electrical signals	3A×15 (D-sub connector) ※2

USP-100A Ordering Information

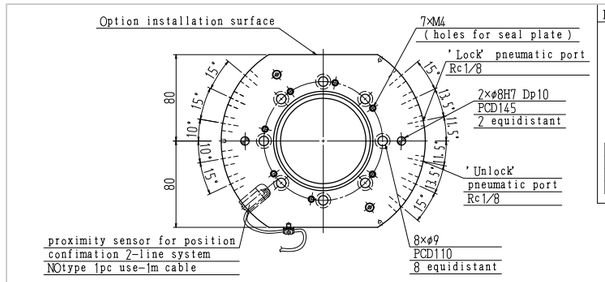
Master plate **USP-100A-M-** (Option) □□□□

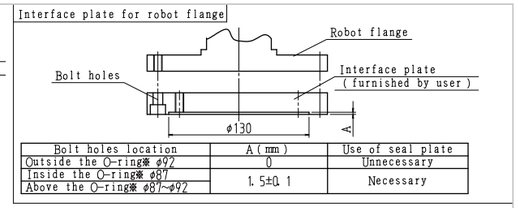
Tool plate **USP-100A-T-** (Option) □□□□

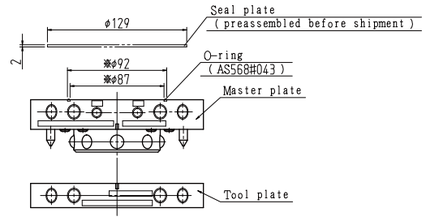
XXXU	No options
D15U	Electrical signals 3A×15 ※2

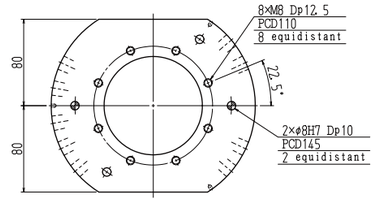
※USP-100A is interchangeable with the previous USP-100.

Main Body Dimensions



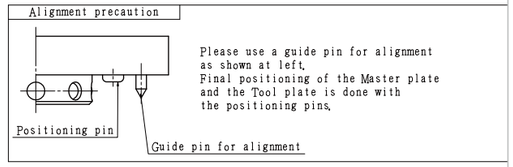






(Model:USP-100A-×××U)

●Eight bolts (M8×30mm) and two locating pin (MSY8-20) are supplied with the Master plate.
●The eight bolts extend 9.5mm above the Master plate. (when seal plate attached)



Options

■Electrical signal contact block

※(Note) The electrical signal connector is user-provided.

D15U

3A×15 D-sub contacts
(female receptacle) ※2

※Please use DDK. 17JE-23150-02(D8A)-CG or its equivalent. on the plug side. (Use RoHS-compliant. D-sub plug products.)

Please contact BL Autotec, Ltd. for detailed information on the options.

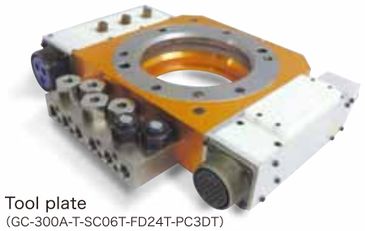
※1 Coupling force is the force to achieve specified repeatability. Coupling force will be maintained until unlock pressure is applied or the device is damaged.
※2. Please provide a 17JE-23150-02(D8A)-CG plug or its equivalent. (D-sub plugs are RoHS.)

Spot-welding Gun-Changer

GC-300A

The BL QUICK-CHANGE Model GC-300A is a device for automatic tool changing, specially designed for changing material handling welding guns or guns with built-in transformers in a spot-welding line. Primary current, air pressure and electrical signals (Servo) modules can be selected for the GC-300A.The GC-300A provides increased production line efficiency and cost effectiveness.

Master plate
(GC-300A-M-SC06M-FD24M-PC3DM-SA)



Tool plate
(GC-300A-T-SC06T-FD24T-PC3DT)

Master plate Attachments
- ·1 Insulation plate
- ·2 insulation pins
- ·6 insulation washers
- ·6 insulation pipes
- ·6 bolts(M10×30)
- ·1 locating pin
- ·6 plain washers

Unidirectional cable and hose

The power and control cables and the pneumatic hose are oriented in a single direction.

The primary current module contains a floating mechanism

The primary current module is equipped with a self-cleaning function and a floating mechanism.

Self-sealing coolant ports

The check valves of the circulating coolant ports are equipped with a PTFE sleeve to prevent liquid spillage.

Superior fail-safe locking mechanism

BL's unique lock/unlock mechanism contains a mechanical fail-safe feature which does not allow the Master and Tool plates to uncouple if the air pressure is shut off.

Specifications

Main Body

Load capacity (rated load)		2,940N(300kg)
Positional repeatability		±0.025mm
Allowable dynamic moment	Bending direction (Tx, Ty)	5,292N·m(540kgf·m)
	Twisting direction (Tz)	4,704N·m(480kgf·m)
Coupling force (with air pressure of 0.49Mpa) ※1		31,360N(3,200kgf)
Materials	Frame	Aluminum alloy
	Lock/ unlock mechanism	Stainless steel
Overall dimension (when coupled with all options)		W355×D265×H165mm
Weight ※2 (with all options)	Master plate	18.5kg
	Tool plate	9.5kg
Lock/ unlock mechanism		Ball-locking mechanism
Required air pressure		0.39~0.68MPa(4~7kgf/cm²)
Allowable temperature and humidity ranges		0~50℃, 35~90%(Non-condensing)
Lock/ unlock sensor	for lock status	1 built-in proximity switch E2E-X2D4 (OMRON)
	for unlock status	1 built-in proximity switch E2E-X2D4 (OMRON)
Approach sensor	for Tool plate position	Two built-in switch E2E-X2D4 (OMRON)

Modules

	Code	Capacity	Master plate side connector	Tool plate side connector
Electrical signal module (Servo module)	ES10M(T)	5A(220V)×10	D/MS3102A28-16P	D/MS3102A28-16S
	ES28M(T)	5A (220V) ×28 ※3	D/MS3102A28-15P	D/MS3102A28-15S
	SC04M(T)	5A (220V) ×28 for signal ※3	D/MS3102A28-15P	D/MS3102A28-15S
		20A (500V) ×4 for servo motor ※4	D/MS3102A20-4P	D/MS3102A20-4S
	SC06M(T)	5A (220V) ×17 for signal	D/MS3102A20-29P	D/MS3102A20-29S
		20A(500V)×5, 13A(500V)×1 } for servo motor ※5	D/MS3102A20-17P	D/MS3102A20-17S

	Code	Self-sealing condact ports (Master/Tool side)	Self-sealing pneumatic ports (Master side)
Fluid module	FD24M(T)	Rc3/8×2	Rc3/8×4
	FD42M(T)	Rc3/8×4	Rc3/8×2
	FD40M(T)	Rc3/8×4	——
	FD02M(T)	——	Rc3/8×2
	FD04M(T)	——	Rc3/8×4
	FD06M(T)	——	Rc3/8×6
	Fluid pressure, 0 ~ Max, 0.68MPa (0 ~ 7kgf/c㎡)		

	Code	Capacity	Master plate side connector	Tool plate side connector
Primary current module	PC3DM(T)	200A (42% usage) 130A in continuous duty 600V ×3	D/MS3102A36-5P	D/MS3102A36-5S
	PC3EM(T)	200A (42% usage) 130A in continuous duty 600V ×3	Seal connector	Seal connector

	Code	Type of pattern	Type of insulation
Interface plate	SA	6 - M10 PCD160	Insulation plate (phenol)
	SB	To user requirements	Insulation washer (POM)

GC-300A Ordering Information

Master plate
GC-300A-M- (Electrical signal module) □□□□M – (Fluid module) □□□□M – (Primary current module) □□□□M – (Interface plate) □□

Tool plate
GC-300A-T- (Electrical signal module) □□□□T – (Fluid module) □□□□T – (Primary current module) □□□□T

(Electrical signal module)	
ESXX	No module
ES28	5A×28※3
ES10	5A×10
SC04	5A×28※3 20A×4 for servo motor ※4
SC06	5A×17 20A×6 for servo motor ※5
ESC0	Cover (Tool plate)

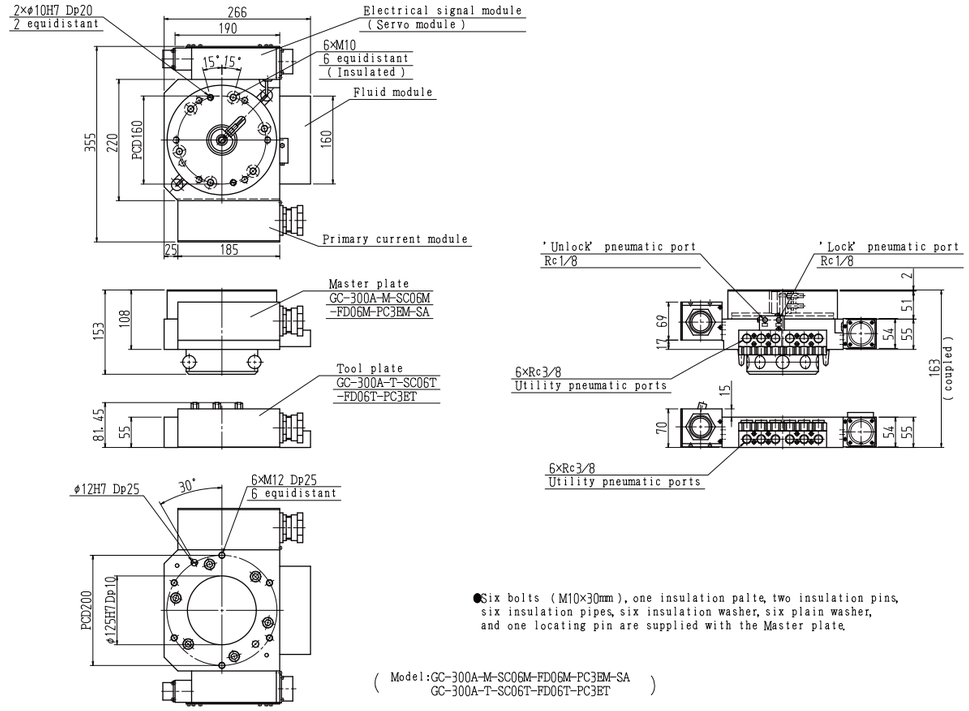
(Fluid module)	
FDXX	No module
FD24	2 coolant parts, 4 pneumatic ports
FD42	4 coolant parts, 2 pneumatic ports
FD40	4 coolant parts, no pneumatic ports
FD02	No coolant part, 2 pneumatic ports
FD04	No coolant part, 4 pneumatic ports
FD06	No coolant part, 6 pneumatic ports

(Primary current module)	
PCXX	No module
PC3D	3 primary current (440V81KVA)
PC3E	3 primary current (440V81KVA)
PCC0	Cover (Tool plate)

(Interface plate)	
SA	For PCD160 robot flange
SB	To user requirements

※GC-300A is interchangeable with the previous GC-300.

Main Body Dimensions



●Six bolts (M10×30mm), one insulation palte, two insulation pins, six insulation pipes, six insulation washer, six plain washer, and one locating pin are supplied with the Master plate.

(Model:GC-300A-M-SC06M-FD06M-PC3EM-SA
GC-300A-T-SC06T-FD06T-PC3ET)

Module

Electrical signal module (Servo module) | Primary current module | Primary current module

Master plate

SC04M. SC06M

Tool plate

SC04T. SC06T

Master plate

PC3DM

Tool plate

PC3DT

Master plate

PC3EM

Tool plate

PC3ET

(Note 1) The connector plug is user-provided.
(Note 2) Please contact BL Autotec, Ltd. for detailed information on the modules.
(Note 3) Please contact BL Autotec, Ltd. for specitic applications.
(Note 4) Please reter to the installation & Maintenance Manual when using.

※1 Coupling force is the force to achieve specified repeatability. Coupling will be maintained until unlock pressure is applied or the device is damaged. ※2 Weight shown is of GC-300-ES-28-FD24-PC3E-SA. ※3 Allowable current is total 113.7Afor connector. ※4 Allowable current is total 62.5A for connector. ※5 Allowable current is total 71.6A for connector.

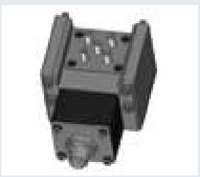
Wire-Saving Module / Contact Block

At the site of FA, it is becoming popular to adapt various network systems in order to reduce wiring. Networks at factories are hierarchically (configurationally) classified by place and information transmission in the network. Our Wire-Saving Module / Contact Block is compliant with networks of several standardized serial data communications and, thus, effective for reducing wiring at factories. We have prepared connectors conforming to several standardized serial data communications.

Contact Blocks that can be equipped with QUICK-CHANGE™ / QUICK-CHANGE ZEUS™ / QUICK-CHANGE GIGA™

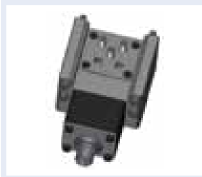
■Examples of optional modules

Master plate side


DeviceNet
with M12 connector type
C1M


CC-Link connector type
C2M


DeviceNet
with UN connector type
C3M


PROFIBUS connector type
C4M


Ethernet connector type
C5M


Powered M12 connector type
C6M


Powered UN connector type
C7M

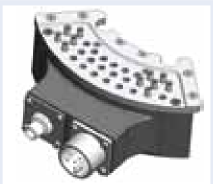
Contact Blocks that can be equipped with QUICK-CHANGE ZEUS™ / QUICK-CHANGE GIGA™

■Examples of optional modules (A or B side)

Integrated type


KUKA standard connector type
C1KAM/C1KBM


Ethernet connector type
C5SAM/C5SBM

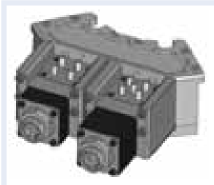

DeviceNet
with M12 connector type
C1EAM/C1KBM


KUKA standard connector type
C16KAT/C16KBT


Ethernet connector type
C5SAT/C5SBT


CC-Link connector type
C2EAT/C2EBT

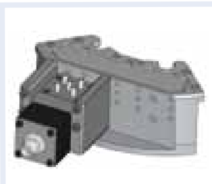
Combined type


DeviceNet
with UN connector type
C7C3AM/C7C3BM


CC-Link &
Powered UN connector type
C2C7AM/C2C7BM


PROFIBUS connector &
Powered M12 connector type
C6C4AT/C6C4BT


Ethernet &
Powered M12 connector type
C5C6AT/C5C6BT


DeviceNet
with M12 connector type
C1XAM/C1XBM


PROFIBUS connector type
C4XAT/C4XBT

Conforming to several standardized serial data communications

DeviceNet	Using dedicated thin cable conforming to DeviceNet standard. We have mini-connectors and micro-connectors available.
CC-Link	Using a dedicated Ver. 1.10 compatible CC-Link cable that is a twisted three-core cable with shield. We have M12 Micro type four-contact A-coding connectors available.
PROFIBUS	Using PROFIBUS DP type-A cable that is twisted wiring with shield. We have M12 Micro type four-contact B-coding connectors available.
Industrial Ethernet	We have category 5e equivalent cable with two pairs of shield is used and M12 Micro type four-contact D-coding connectors available. These connectors conform to EtherNet/IP, EtherCAT, PROFINET.

Options

■Module for A side and B side

	Model	Capacity and number of contacts	Connector for Master Plate side	Connector for Tool Plate side
Industrial Network Module with attachment	C1XAM(T) C1XBM(T)	3A (60v) x 5 contacts type for DeviceNet M12 connector *including drain wire	Micro-style Connector M12, A-coding, 5 contacts Male	Micro-style Connector M12, A-coding, 5 contacts Female
	C2XAM(T) C2XBM(T)	3A(125V) x 4 contacts type for CC-Link *including shield	Micro-style Connector M12, A-coding, 4 contacts Male	Micro-style Connector M12, A-coding, 4 contacts Female
	C3XAM(T) C3XBM(T)	8A (24v) x 5 contacts type for DeviceNet UN connector *including drain wire	Mini-style Connector 7/8-16UN, 5 contacts Male	Mini-style Connector 7/8-16UN, 5 contacts Female
	C4XAM(T) C4XBM(T)	4A (160v) x 2 contacts type for PROFIBUS connector	Micro-style Connector M12, B-coding, 4 contacts Male	Micro-style Connector M12, B-coding, 4 contacts Female
	C5XAM(T) C5XBM(T)	3A (30v) x 4 contacts type for Ethernet connector	Micro-style Connector M12, D-coding, 4 contacts Female	Micro-style Connector M12, D-coding, 4 contacts Female
	C6XAM(T) C6XBM(T)	3A (125v) x 4 contacts type for Powered M12 connector	Micro-style Connector M12, A-coding, 4 contacts Male	Micro-style Connector M12, A-coding, 4 contacts Female
	C7XAM(T) C7XBM(T)	13A (25v) x 4 contacts type for Powered UN connector	Mini-style Connector 7/8-16UN, 4 contacts Male	Mini-style Connector 7/8-16UN, 4 contacts Female
Servo/ Industrial Network Module	C1SAM(T) C1SBM(T)	Servo Power 20A(500V)×6	D/M3102A20-17P	D/M3102A20-17S
		Servo Signal 5A(220V)×17	D/M3102A20-29P	D/M3102A20-29S
		3A (60v) x 5 contacts type for DeviceNet M12 connector *including drain wire	Micro-style Connector M12, A-coding, 5 contacts Male	Micro-style Connector M12, A-coding, 5 contacts Female
	C2SAM(T) C2SBM(T)	Servo Power 20A(500V)×6	D/M3102A20-17P	D/M3102A20-17S
		Servo Signal 5A(220V)×17	D/M3102A20-29P	D/M3102A20-29S
		3A(125V) x 4 contacts type for CC-Link *including shield	Micro-style Connector M12, A-coding, 4 contacts Male	Micro-style Connector M12, A-coding, 4 contacts Female
	C3SAM(T) C3SBM(T)	Servo Power 20A(500V)×6	D/M3102A20-17P	D/M3102A20-17S
		Servo Signal 5A(220V)×17	D/M3102A20-29P	D/M3102A20-29S
		8A (24v) x 5 contacts type for DeviceNet UN connector *including drain wire	Mini-style Connector 7/8-16UN, 5 contacts Male	Mini-style Connector 7/8-16UN, 5 contacts Female
	C4SAM(T) C4SBM(T)	Servo Power 20A(500V)×6	D/M3102A20-17P	D/M3102A20-17S
		Servo Signal 5A(220V)×17	D/M3102A20-29P	D/M3102A20-29S
		4A (160v) x 2 contacts type for PROFIBUS connector	Micro-style Connector M12, B-coding, 4 contacts Male	Micro-style Connector M12, B-coding, 4 contacts Female
	C5SAM(T) C5SBM(T)	Servo Power 20A(500V)×6	D/M3102A20-17P	D/M3102A20-17S
		Servo Signal 5A(220V)×17	D/M3102A20-29P	D/M3102A20-29S
		3A (30v) x 4 contacts type for Ethernet connector	Micro-style Connector M12, D-coding, 4 contacts Female	Micro-style Connector M12, D-coding, 4 contacts Female
	C1EAM(T) C1EBM(T)	Servo Power 20A(500V)×6	D/M3102A20-17P	D/M3102A20-17S
		3A (60v) x 5 contacts type for DeviceNet M12 connector *including drain wire	Micro-style Connector M12, A-coding, 5 contacts Male	Micro-style Connector M12, A-coding, 5 contacts Female
	C2EAM(T) C2EBM(T)	Servo Power 20A(500V)×6	D/M3102A20-17P	D/M3102A20-17S
		3A(125V) x 4 contacts type for CC-Link *including shield	Micro-style Connector M12, A-coding, 4 contacts Male	Micro-style Connector M12, A-coding, 4 contacts Female
	C3EAM(T) C3EBM(T)	Servo Power 20A(500V)×6	D/M3102A20-17P	D/M3102A20-17S
		8A (24v) x 5 contacts type for DeviceNet UN connector *including drain wire	Mini-style Connector 7/8-16UN, 5 contacts Male	Mini-style Connector 7/8-16UN, 5 contacts Female
	C4EAM(T) C4EBM(T)	Servo Power 20A(500V)×6	D/M3102A20-17P	D/M3102A20-17S
		4A (160v) x 2 contacts type for PROFIBUS connector	Micro-style Connector M12, B-coding, 4 contacts Male	Micro-style Connector M12, B-coding, 4 contacts Female
	C5EAM(T) C5EBM(T)	Servo Power 20A(500V)×6	D/M3102A20-17P	D/M3102A20-17S
		3A (30v) x 4 contacts type for Ethernet connector	Micro-style Connector M12, D-coding, 4 contacts Female	Micro-style Connector M12, D-coding, 4 contacts Female
Industrial Network Module	C1NAT C1NBT	3A (60v) x 5 contacts type for DeviceNet M12 connector *including drain wire	Micro-style Connector M12, A-coding, 5 contacts Male	Micro-style Connector M12, A-coding, 5 contacts Female
	C2NAT C2NBT	3A(125V) x 4 contacts type for CC-Link *including shield	Micro-style Connector M12, A-coding, 4 contacts Male	Micro-style Connector M12, A-coding, 4 contacts Female
	C3NAT C3NBT	8A (24v) x 5 contacts type for DeviceNet UN connector *including drain wire	Mini-style Connector 7/8-16UN, 5 contacts Male	Mini-style Connector 7/8-16UN, 5 contacts Female
	C4NAT C4NBT	4A (160v) x 2 contacts type for PROFIBUS connector	Micro-style Connector M12, B-coding, 4 contacts Male	Micro-style Connector M12, D-coding, 4 contacts Female
	C5NAT C5NBT	3A (30v) x 4 contacts type for Ethernet connector	Micro-style Connector M12, D-coding, 4 contacts Female	Micro-style Connector M12, D-coding, 4 contacts Female

	Model	Capacity and number of contacts	Connector for Master Plate side	Connector for Tool Plate side
Servo/ Industrial Network Module for KUKA	C1KAM C1KBM	Servo Power 20A(500V)×6 *including ground	BEGA116NN00000201000	
		Servo Signal 5A(220V)×17 *including shield	AEGA052NN00000200000	
		7A (125v) x 9 contacts type for DeviceNet & Power connector *including drain wire	AEGA113NN00000200000	
	C4KAM C4KBM	Servo Power 20A(500V)×6 *including ground	BEGA116NN00000201000	
		Servo Signal 5A(220V)×17 *including shield	AEGA052NN00000200000	
		7A (125v) x 7 contacts type for PROFIBUS & Power connector *including shield	AEGA113NN00000200000	
Servo Module for KUKA	SEKAT SEKBT	Servo Power 20A(500V)×6 *including ground		BEGA116NN00000201000
		Servo Signal 7A(160V)×12 *including shield		AEGA052NN00000200000
Industrial Network Module f or KUKA	C16KAT C16KBT	3A (60v) x 5 contacts type for DeviceNet M12 connector *including drain wire		Micro-style Connector M12, A-coding, 5 contacts Female
		3A (125v) x 4 contacts type for Powered M12 connector		Micro-style Connector M12, A-coding, 4 contacts Female
	C17KAT C17KBT	3A (60v) x 5 contacts type for DeviceNet M12 connector *including drain wire		Micro-style Connector M12, A-coding, 5 contacts Female
		7A (25v) x 4 contacts type for Powered UN connector		Mini-style Connector 7/8-16UN, 4 contacts Female
	C36KAT C36KBT	7A (24v) x 5 contacts type for DeviceNet UN connector *including drain wire		Mini-style Connector 7/8-16UN, 5 contacts Female
		3A (125v) x 4 contacts type for Powered M12 connector		Micro-style Connector M12, A-coding, 4 contacts Female
	C37KAT C37KBT	7A (24v) x 5 contacts type for DeviceNet UN connector *including drain wire		Mini-style Connector 7/8-16UN, 5 contacts Female
		7A (25v) x 4 contacts type for Powered UN connector		Mini-style Connector 7/8-16UN, 4 contacts Female
	C46KAT C46KBT	4A (160v) x 2 contacts type for PROFIBUS connector		Micro-style Connector M12, B-coding, 4 contacts Female
		3A (125v) x 4 contacts type for Powered M12 connector		Micro-style Connector M12, A-coding, 4 contacts Female
	C47KAT C47KBT	4A (160v) x 2 contacts type for PROFIBUS connector		Micro-style Connector M12, B-coding, 4 contacts Female
		7A (25v) x 4 contacts type for Powered UN connector		Mini-style Connector 7/8-16UN, 4 contacts Female

※ The Master for KUKA can be only coupled with the tool for KUKA

■Module for C side and D side

	Model	Capacity and number of contacts	Connector for Master Plate side	Connector for Tool Plate side
Industrial Network Module with attachment	C1CM(T) C1DM(T)	3A (60v) x 5 contacts type for DeviceNet M12 connector *including drain wire	Micro-style Connector M12, A-coding, 5 contacts Male	Micro-style Connector M12, A-coding, 5 contacts Female
	C2CM(T) C2DM(T)	3A(125V) x 4 contacts type for CC-Link *including shield	Micro-style Connector M12, A-coding, 4 contacts Male	Micro-style Connector M12, A-coding, 4 contacts Female
	C3CM(T) C3DM(T)	8A (24v) x 5 contacts type for DeviceNet UN connector *including drain wire	Mini-style Connector 7/8-16UN, 5 contacts Male	Mini-style Connector 7/8-16UN, 5 contacts Female
	C4CM(T) C4DM(T)	4A (160v) x 2 contacts type for PROFIBUS connector	Micro-style Connector M12, B-coding, 4 contacts Male	Micro-style Connector M12, B-coding, 4 contacts Female
	C5CM(T) C5DM(T)	3A (30v) x 4 contacts type for Ethernet connector	Micro-style Connector M12, D-coding, 4 contacts Female	Micro-style Connector M12, D-coding, 4 contacts Female
	C6CM(T) C6DM(T)	3A (125v) x 4 contacts type for Powered M12 connector	Micro-style Connector M12, A-coding, 4 contacts Male	Micro-style Connector M12, A-coding, 4 contacts Female
	C7CM(T) C7DM(T)	13A (25v) x 4 contacts type for Powered UN connector	Mini-style Connector 7/8-16UN, 4 contacts Male	Mini-style Connector 7/8-16UN, 4 contacts Female

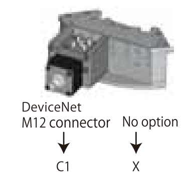
■Details of Attachment part number

Abbreviation	Module part number	Details
J	J16A	5A×16 (JM connector)
M	M10A	13A×10 (MS connector)
MW	M10WA	13A×10 (Drip-Proof MS connector)
R	R16	5A×16 (Connector-less speccification for Tool side only)
BN	BFN	Non-Contact Electric Signal Block with 15 contacts, NPN Output only for Master side
BP	BFP	Non-Contact Electric Signal Block with 15 contacts, PNP Output only for Master side
BD	BFD	Non-Contact Electric Signal Block with 15 contacts, Sensor Input only for Tool side
C1	C1	DeviceNet M12 connector
C2	C2	CC-Link connector
C3	C3	DeviceNet UN connector
C4	C4	PROFIBUS connector
C5	C5	Ethernet connector
C6	C6	Powered M12 connector
C7	C7	Powered UN connector

■Examples

JMAM	J16+M10 A Side Master
XMBM	No option +M10 B Side Master
JC1AT	J16+C1 A Side Tool

C1XAM : DeviceNet M12 Connector +No option A Side Master



※ Please Keep in mind that compared to the picture above left and right will be opposite in actual installation

Non-contact electric signal block

Non-contact electric signal block (Remote Sensor Modules) can be equipped on BL Quick-Change to transmit signals in dusty or wet environments.

Applications

- Tool changes requiring proximity sensors for signal transmission in welding processes with sputter or fumes.
- Tool changes requiring proximity sensors for signal transmission in processes using coolants or cleaning processes using water.

Features

- Contact-free sensor input signal transmission without contact (Up to 15 lines, two wire systems, 12V)
- The IP67-structure in the signal transmission unit has superior resistance to dust and water, and the contacts are maintenance-free.
- Long service life without abrasion to the contacts.

Applicable models

- Flex-40B, QC-60D, Flex-70A, Flex-100B, QCP-100A, QC-150C, QCP-220, Flex-300A, ZEUS, GIGA

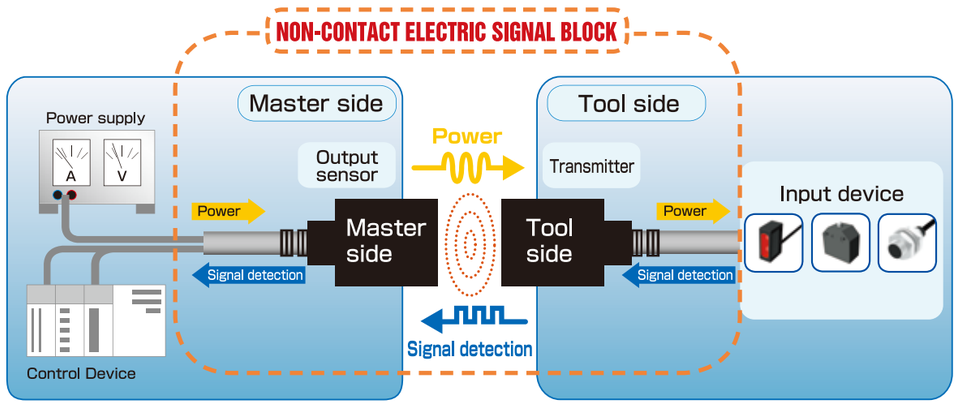
Quick-Change Flex-100B with Non-contact electric signal block (Box shape, 15 signals)

Specifications

Master side (output sensor)		
Model	NPN output	B15N-M
	PNP output	B15P-M
Connector		WEBR-2119MS-D
Power source		24V DC + 10 ～ 20% （including ripple)
Consumption current		≦ 500mA
Number of output signals		15 ＋1 （In-zone)
Load current		≦50mA / 1 output
Response frequency		20Hz
LED indicator		In-zone display
Operating temperature		0 ～ +50℃
Protective structure		IP67
Weight		Module 240g

Tool side (transmitter)	
Model	B15D-T
Connector	WEBR-2116FS-D
Drive voltage	12V ± 1.5V DC
Wiring	2-wire DC
Number of input signals	15
Drive current	5mA
Operating temperature	0 ～ +50℃
Protective structure	IP67
Weight	Module 244g

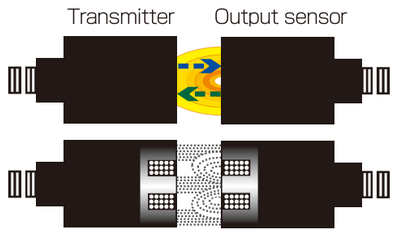
Non-contact electric signal block function



Non-contact electric signal block simultaneously provide power and transmit wireless signals to equipment, using an output unit and a transmitter. Output for power and controls are connected to the master side. Sensors are connected to the tool side for signal transmission.

Non-contact electric signal block

Non-contact electric signal block provide power supply and signal transmission for electromagnetic coupling. Power supply and signal transmission occur when the transmitting side enters the field of the output unit.

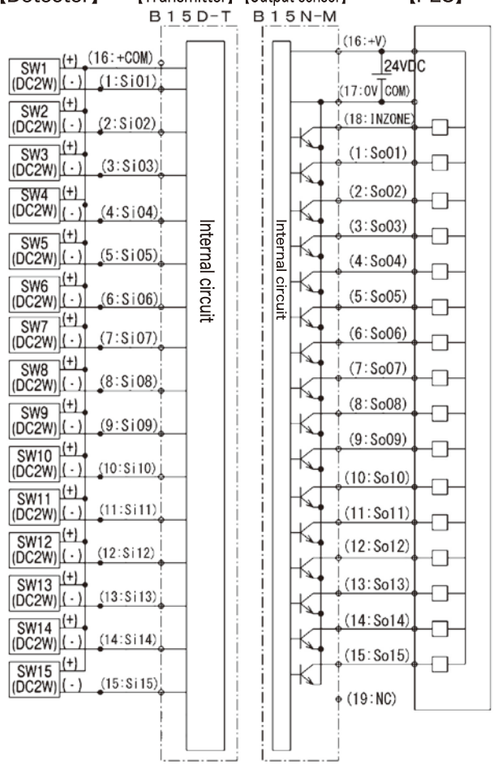


(Electromagnetic coupling)

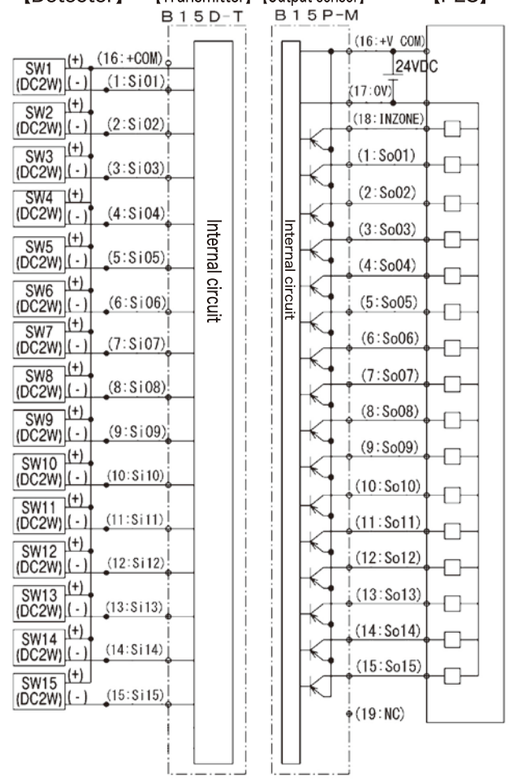
Wiring diagram

DC2W switch connection spec (including contact switch)

■ NPN connection : B15D-T ～ B15N-M



■ PNP connection : B15D-T ～ B15P-M



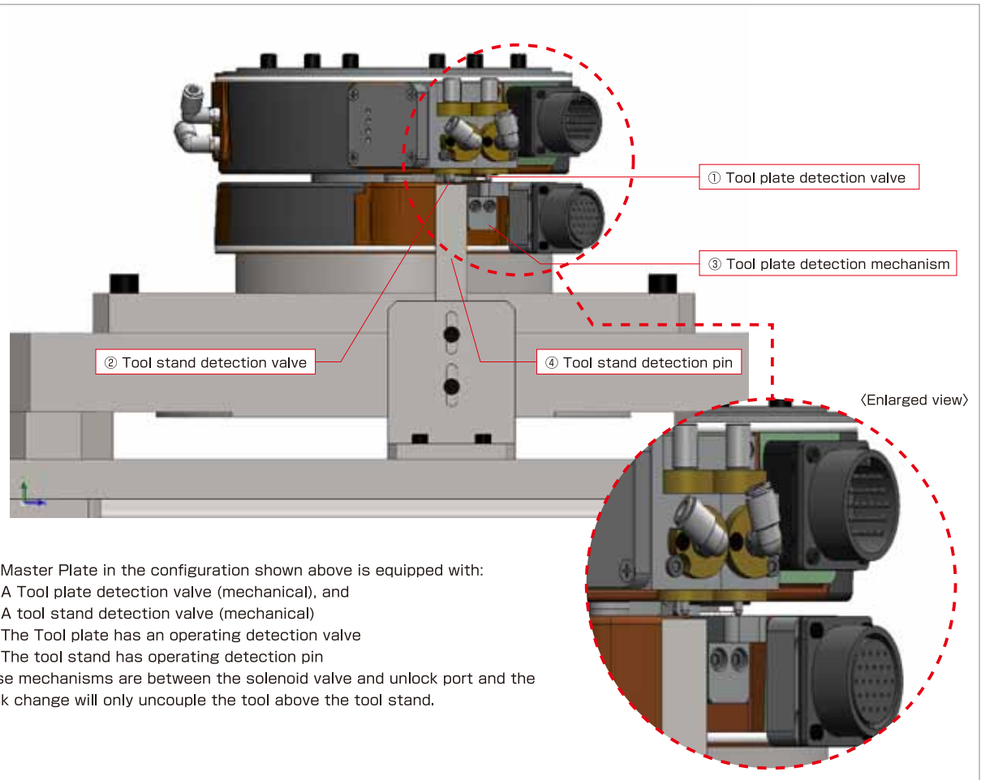
A mechanical safety valve prevents Tool plate drops

■A mechanical safety valve prevents Tool plate drops

A "fail-safe" mechanism is available to prevent the tool separating from the Tool Plate due to operational error, solenoid valve failure or malfunction due to noise.

■Examples of operational error

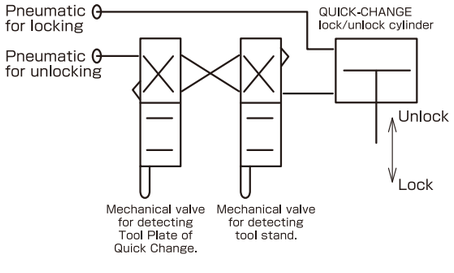
- ●Operator attempts to unlock the tool from the Tool Plate in area other than above the Tool stand.
- ●Switch controlling solenoid valve inadvertently touched during operation or maintenance.



The Master Plate in the configuration shown above is equipped with:

① A Tool plate detection valve (mechanical), and
② A tool stand detection valve (mechanical)
③ The Tool plate has an operating detection valve
④ The tool stand has operating detection pin

These mechanisms are between the solenoid valve and unlock port and the Quick change will only uncouple the tool above the tool stand.



Status	1 Lock/unlock position	2 Separated state	3 Operating state	4 No Tool Plate
Mechanical valve for detecting Tool Plate of Quick Change.	On	Off	On	Off
Mechanical valve for detecting tool stand.	On	Off	Off	On
Pneumatic for unlocking	Unlocking operation possible	Unlocking operation possible	Unlocking operation not possible	Unlocking operation not possible

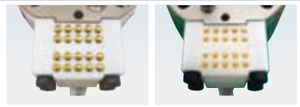
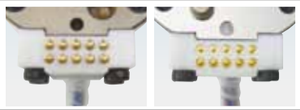
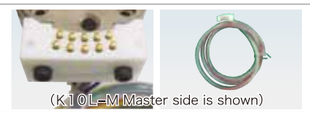
Standard equipment for QUICK-CHANGE GIGA
Available for models including and over 100kg load capacity. Please contact BL Autotec for details.
This mechanism is patented.

MEMO

BL QUICK-CHANGE™ Options (QCE, QC, Light, Flex, QCP, USP Series)

1.Electric Signal Contact Block

※ Tool weight in parentheses

Type	QC model	Pictures	Spec. & weight	Features & Remarks
D-M(T)	QC-1		3A×10 DC50V 8g (8g) ※	*Spring probe pressing method *Solder terminal
H10A-M(T)	Light-5A		3A×10 DC50V 11g (10g) ※	*Spring probe pressing method *Solder terminal
H20A-M(T)	Light-5A		3A×20 DC50V 24g (22g) ※	*Spring probe pressing method *Solder terminal
H30A-M(T)	Light-5A		3A×30 DC50V 36g (34g) ※	*Spring probe pressing method *Solder terminal
H10L-M(T)	Light-5A		3A×10 DC50V 11g(10g)	*Spring probe pressing method *With 1m lead wire
H20L-M(T)	Light-5A		3A×20 DC50V 24g(22g)	*Spring probe pressing method *With 1m lead wire
K10A-M(T)	QC-10B		3A×10 DC50V 15g (13g) ※	*Spring probe pressing method *Solder terminal
K20A-M(T)	QC-10B		3A×20 DC50V 23g (20g) ※	*Spring probe pressing method *Solder terminal
K10L-M(T)	QC-10B	 (K10L-M Master side is shown)	3A×10 DC50V 15g (13g) ※	*Spring probe pressing method *With 1m lead wire
K20L-M(T)	QC-10B		3A×20 DC50V 23g (20g) ※	*Spring probe pressing method *With 1m lead wire
D15N-M(T)	QC-20D, QC-60D		3A×15 DC50V 30g (21g) ※	*Spring probe pressing method
D15Y-M(T) D15A, B-M(T) D15U-M(T)	QC-60D Flex-40B Flex-70A, 100B USP-100A		3A×15 DC50V Y : 87g (73g) ※ A, B : 62g (51g) ※ U: 90g(70g) ※	*Spring probe pressing method *With mounting plate
D37N-M(T) D37Z-M(T)	QC-150C	 (D37N is shown)	3A×37 DC50V N : 65g (50g) ※ Z : 220g (180g) ※	*Spring probe pressing method *D37Z comes with mounting plate

BL QUICK-CHANGE™ Options (QCE, QC, Light, Flex, QCP, USP, ZEUS, GIGA Series)

※ Tool weight in parentheses

Type	QC model	Pictures	Spec. & weight	Features & Remarks
J16A, B, Z-M(T) J16Y-M(T) ＊J32A, B	QCE-40, Flex-40B Flex-70A, 100B QCP-100A, QC-150C QCP-220 (T), Flex-300A QC-60D (取付板付) ZEUS, GIGA ＊Flex-300Aonly		5A×16 DC/AC200V 170g(140g) ※ 220g(190g) ※ └ J16Y	*Spring probe pressing method *Labyrinth structure block ※J32A, B: Parallel mounting of J16A, B: weight doubled
L16A-M	QCP-100A, 220 ZEUS, GIGA Master side only		5A×16 DC/AC200V 200g	*Spring probe pressing method *Built-in lock/unlock signal
R16A-T R16B-T	QCP-100A ZEUS, GIGA Tool side only		5A×1 DC/AC200V 80g	*No Connector (Metal cover) *Cable exits in Z direction (soldered)
A16A, B-M(T) A16Z-M(T)	QCE-40, Flex-40B, 70A QC-150C ZEUS, GIGA		5A×16 DC/AC200V 200g(160g) ※	*Added approach sensor function
M10A, B, Z-M (T) M10Y-M(T) ＊M20A, B	QCE-40, Flex-40B Flex-70A, 100B QCP-100A, QC-150C QCP-220, Flex-300A QC-60D (with mounting plate) ZEUS, GIGA ＊Flex-300A only		13A×10 DC250V/AC200V 260g(220g) ※ 310g(260g) ※ └ M10Y	*Insertion contacts *Labyrinth structure block ※M20A, B: Parallel mounting of M10A, B: weight doubled
L07A-M(T)	QCP-100A ZEUS, GIGA Master side only		13A×7 DC250V/AC200V 290g	*Insertion contacts *Labyrinth structure block ※Built-in three lock/unlock signals
A08A, B-M(T) A08-ZM(T)	QCE-40, Flex-40B Flex-70A QC-150C ZEUS, GIGA		13A×8 DC250V/AC200V 290g(240g) ※	*Added approach *sensor function ※Built-in two sensor signals
B15N-M B15P-M	Flex-40B, QC-60D Flex-70A, 100B QCP-100A, QC-150C QCP-220, Flex-300A ZEUS, GIGA Master side only		50mA×15 DC24V 240g	・Non-contact signal transmission ・12V 2 wire system, Max.15 signals ・Correspond IP67 (Waterproof, Dust-proof structure)
B15D-T	Flex-40B, QC-60D Flex-70A, 100B QCP-100A, QC-150C QCP-220, Flex-300A ZEUS, GIGA Tool side only		5mA×15 DC12V 244g	・Non-contact signal transmission ・12V 2 wire system, Max.15 signals ・Correspond IP67 (Waterproof, Dust-proof structure)

BL QUICK-CHANGE™ Options (QCE, QC, Light, Flex, QCP, USP, ZEUS, GIGA Series)

2.Ground (for Spot-welding material handling)

※ Tool weight in parentheses

Type	QC model	Pictures	Spec. & weight	Features & Remarks
E50A, B-M(T) E50Z-M (T)	Flex-70A, 100B, 300A QC-150C ZEUS, GIGA ※Available for other models. Please contact us.		500A×1 750g (280g) ※	50% usage rate

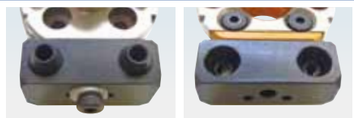
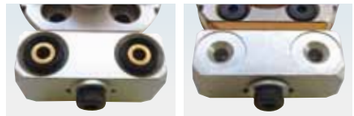
3.Lock/unlock sensor (with robot adaptor plate)

※ Tool weight in parentheses

Type	QC model	Pictures	Spec. & weight	Features & Remarks
SA SB	Flex-40B, QC-60D Flex-70A, Flex-100B QC-150C, Flex-300A QCP-100	(Sample picture shows SA for QC-60C) 	Two-wire proximity sensor T = about 40mm or more	SA: Customer processes the adaptor plate SB: BL Autotec process the adaptor plate

4.Pneumatic ports (Additional)

※ Tool weight in parentheses

Type	QC model	Pictures	Spec, flow (Nl/min) & weight	Features & Remarks
P-M(T)	QC-1		Positive pressure M3×2 11g(8g)	
V-M(T)	QC-1		Negative pressure M3×2 13g(8g)	
P18A-M(T) P18B-M(T) P18Z-M(T)	Flex-40B, 70A, 100B Flex-300A QC-150C		Rc1/8×4 200～1,000 160g (160g) ※	*The flow per port varies, based on inside diameter of hose of 3～7.5.
P18Y	QC-60D	※High Electrical Current Module	Same as above	Same as above
P14A-M(T) P14B-M(T) P14Z-M(T)	Flex-40B, 70A, 100B Flex-300A QC-150C		Rc1/4×2 300～1,800 140g (140g) ※	*The flow per port varies, based on inside diameter of hose of 3～9.0.
P14Y	QC-60D	※High Electrical Current Module	Same as above	Same as above
P38A P38B P38Z	Flex-100B Flex-300A QC-150C		Rc3/8×4 700～4,000 380g (370g) ※	*The flow per port varies, based on inside diameter of hose of 4.5～13.0.
P3WA P3WB P3WZ	Flex-70A, 100B Flex-300A QC-150C		Rc3/8×2 700～4,000 200g (190g) ※	*The flow per port varies, based on inside diameter of hose of 4.5～13.0.

BL QUICK-CHANGE™ Options (QCE, QC, Light, Flex, QCP, USP Series)

5.Individually-ordered manufacturing examples

Type	QC model	Pictures	Spec.	Features & Remarks
Remote Sensor Module	Flex-40B, QC-60D Flex-70A,Flex-100B QC-150C, Flex-300A		With mounting plate for items shown above	*Non-contact remote sensor *IP67 support *Withanti-spatter specification
Hige Electrical Current Module	Flex-100B QC-150C Flex-300A		35A×4	*High elecrical current power transmission
20-contact Insertion Module	QC-150C QCP-220 Flex-300A		5A×20 DC250V/AC200V	*Insertion contacts *Labyrinth structure block *Can be used with 13A spec
Z Direction Wiring Harness Module	Flex-40B, QC-60D Flex-70A, Flex-100B QCP-100A, QC-150C QCP-220 (T), Flex-300A	 (The Master side is shown)	5A×16 DC/AC200V	*Harness connection with cable exit in Z direction to avoid interference *Available with insertion contact block *May be combined with standard contact blocks

BL QUICK-CHANGE Options (QCE, QC, Light, Flex, QCP, USP Series)

Contact Block Option Installation Table

※ ○: May be installed on the mounting surface shown; —: no standard installation (contact us for non-standard applications)

Contact block	QC-1	Light-5A	QC-10B	QC-20D	Flex-40B	QC-60D	Flex-70A	Flex-100B	QCP-100A	QC-150C	QCP-220	Flex-300A	USP-100A
H10A	—	○	—	△	△	△	△	△	△	△	△	△	△
H20A	—	○	—	△	△	△	△	△	△	△	△	△	△
H30A	—	○	—	△	△	△	△	△	△	△	△	△	△
H10L	—	○	—	△	△	△	△	△	△	△	△	△	△
H20L	—	○	—	△	△	△	△	△	△	△	△	△	△
K10A	—	—	○	△	△	△	△	△	△	△	△	△	△
K20A	—	—	○	△	△	△	△	△	△	△	△	△	△
K10L	—	—	○	△	△	△	△	△	△	△	△	△	△
K20L	—	—	○	△	△	△	△	△	△	△	△	△	△
D15	—	—	—	○	A B	N Y	A B	A B	△	△	△	△	U
D37	—	—	—	△	△	△	△	△	△	N Z	△	△	△
J16	—	—	—	—	A B	Y	A B	A B	A B	Z	A B	A B	△
J32	—	—	—	—	A B	Y	A B	A B	A B	Z	A B	A B	△
L16-M	—	—	—	—	△	△	△	△	A	△	A	△	△
R16-T	—	—	—	—	△	△	△	△	A B	△	△	△	△
A16	—	—	—	—	A B	△	A B	△	△	Z	△	△	△
M10	—	—	—	—	A B	Y	A B	A B	A B	Z	B	A B	△
M20	—	—	—	—	A B	Y	A B	A B	A B	Z	B	A B	△
L07-M	—	—	—	—	△	△	△	△	A	△	△	△	△
A08	—	—	—	—	A B	△	A B	△	△	Z	△	△	△
B-15	—	—	—	—	A B	Y	A B	A B	A B	Z	B	A B	△

※Note 1: When using real time communications with reduced wiring or servo encoder signals, use M10, L07M, A08 insertion contacts. ※Note 2: Indicate J32A (B) when installing two J16A(B) on Flex-300, and M20A(B) when installing two M10A(B). ※Note 3: L16M/L07M can only be installed on the master side and R16T can only be installed on the tool side.

Ground	QC-1	Light-5A	QC-10B	QC-20D	Flex-40B	QC-60D	Flex-70A	Flex-100B	QCP-100A	QC-150C	QCP-220	Flex-300A	USP-100A
E50	—	—	—	—	—	—	A B	A B	△	Z	△	A B	△

Pneumatic ports	QC-1	Light-5A	QC-10B	QC-20D	Flex-40B	QC-60D	Flex-70A	Flex-100B	QCP-100A	QC-150C	QCP-220	Flex-300A	USP-100A
P	A1,A2 B1,B2	—	—	—	—	—	—	—	—	—	—	—	—
V	A1,A2 B1,B2	—	—	—	—	—	—	—	—	—	—	—	—
P18	—	—	—	—	A B	Y	A B	A B	△	Z	△	A B	△
P14	—	—	—	—	A B	Y	A B	A B	△	Z	△	A B	△
P38	—	—	—	—	△	△	△	A B	A B	Z	B	A B	△
P3W	—	—	—	—	△	△	A B	A B	△	Z	B	A B	△

BL QUICK-CHANGE™

Electric Contact Block Connector Table

Contact block	Master side Tool side	Plug (Plugs made by DDK Inc.)	Shape	Cable clamp
Flex-100B Flex-300A	Master side	D/MS3106A18-1S	Solid-shell S type	D/MS3057-10A
		D/MS3106B18-1S	Divided-shell S type	D/MS3057-10A
		D/MS3108B18-1S	Divided-shell L type	D/MS3057-10A
Flex-100B Flex-300A	Tool side	D/MS3106A14S-5P	Solid-shell S type	D/MS3057-6A
		D/MS3106B14S-5P	Divided-shell S type	D/MS3057-6A
		D/MS3108B14S-5P	Divided-shell L type	D/MS3057-6A
ZEUS GIGA	Master side	D/MS3106A24-28S	Solid-shell S type	D/MS3057-16A
		D/MS3106B24-28S	Divided-shell S type	D/MS3057-16A
		D/MS3108B24-28S	Divided-shell L type	D/MS3057-16A
ZEUS GIGA	Tool side	D/MS3106A24-28P	Solid-shell S type	D/MS3057-16A
		D/MS3106B24-28P	Divided-shell S type	D/MS3057-16A
		D/MS3108B24-28P	Divided-shell L type	D/MS3057-16A

QUICK-CHANGE QC/Light/Flex/QCP/USP/QCE/ZEUS/GIGA Series

Electric Contact Block Connector Table

Contact block	Master side Tool side	Plug (Plugs made by DDK Inc.)	Shape	Cable clamp
D15A, B, N, Y	Master side	17JE-23150-02(D8A)-CG	Flat	No
	Tool side			
D37N, Z	Master side	17JE-23370-02(D8A)-CG	Flat	No
	Tool side			
J16A, Y, Z-M	Master side	JMSP-2116F-D	Straight type	No
		JMLP-2116F-D	90 degree type	No
J16A, Y, Z-T	Tool side	JMSP-2116M-D	Straight type	No
		JMLP-2116M-D	90 degree type	No
J16B-M	Master side	JMSP-2116FX-D	Straight type	No
		JMLP-2116FX-D	90 degree type	No
J16B-T	Tool side	JMSP-2116MX-D	Straight type	No
		JMLP-2116MX-D	90 degree type	No
L16A-M	Master side	JMSP-2119F-D	Straight type	No
		JMLP-2119F-D	90 degree type	No
A16A, Z-M	Master side	JMSP-2119F-D	Straight type	No
		JMLP-2119F-D	90 degree type	No
A16A, Z-T	Tool side	JMSP-2116M-D	Straight type	No
		JMLP-2116M-D	90 degree type	No
A16B-M	Master side	JMSP-2119FX-D	Straight type	No
		JMLP-2119FX-D	90 degree type	No
J16B-T	Tool side	JMSP-2116MX-D	Straight type	No
		JMLP-2116MX-D	90 degree type	No
M10A, Y, Z-M	Master side	D/MS3106A18-1S	Solid-shell S type	D/MS3057-10A
		D/MS3106B18-1S	Divided-shell S type	D/MS3057-10A
		D/MS3108B18-1S	Divided-shell L type	D/MS3057-10A
M10A, Y, Z-T	Tool side	D/MS3106A18-1P	Solid-shell S type	D/MS3057-10A
		D/MS3106B18-1P	Divided-shell S type	D/MS3057-10A
		D/MS3108B18-1P	Divided-shell L type	D/MS3057-10A
M10B-M	Master side	D/MS3106A18-19S	Solid-shell S type	D/MS3057-10A
		D/MS3106B18-19S	Divided-shell S type	D/MS3057-10A
		D/MS3108B18-19S	Divided-shell L type	D/MS3057-10A
M10B-T	Tool side	D/MS3106A18-19P	Solid-shell S type	D/MS3057-10A
		D/MS3106B18-19P	Divided-shell S type	D/MS3057-10A
		D/MS3108B18-19P	Divided-shell L type	D/MS3057-10A
M06Y-M	Master side	D/MS3106A14S-6S	Solid S type	D/MS3057-6A
		D/MS3106B14S-6S	Divided S type	D/MS3057-6A
		D/MS3108B14S-6S	Divided L type	D/MS3057-6A
M06Y-T	Tool side	D/MS3106A14S-6P	Solid S type	D/MS3057-6A
		D/MS3106B14S-6P	Divided S type	D/MS3057-6A
		D/MS3108B14S-6P	Divided L type	D/MS3057-6A
L07A-M	Master side	D/MS3106A18-1S	Solid-shell S type	D/MS3057-10A
		D/MS3106B18-1S	Divided-shell S type	D/MS3057-10A
		D/MS3108B18-1S	Divided-shell L type	D/MS3057-10A
A08A. Z-M	Master side	D/MS3106A18-1S	Solid-shell S type	D/MS3057-10A
		D/MS3106B18-1S	Divided-shell S type	D/MS3057-10A
		D/MS3108B18-1S	Divided-shell L type	D/MS3057-10A
A08A, Z-T	Tool side	D/MS3106A18-1P	Solid-shell S type	D/MS3057-10A
		D/MS3106B18-1P	Divided-shell S type	D/MS3057-10A
		D/MS3108B18-1P	Divided-shell L type	D/MS3057-10A
A08B-M	Master side	D/MS3106A18-19S	Solid-shell S type	D/MS3057-10A
		D/MS3106B18-19S	Divided-shell S type	D/MS3057-10A
		D/MS3108B18-19S	Divided-shell L type	D/MS3057-10A
A08A, Z-T	Tool side	D/MS3106A18-19P	Solid-shell S type	D/MS3057-10A
		D/MS3106B18-19P	Divided-shell S type	D/MS3057-10A
		D/MS3108B18-19P	Divided-shell L type	D/MS3057-10A
B15N(P)A, B, Y, Z-M	Master side	WEBSP2119F-1-D	Straight type	No
B15DA, B, Y, Z-T	Tool side	WEBSP2116M-1-D	Straight type	No

QUICK-CHANGE™ Options (ZEUS, GIGA Series)

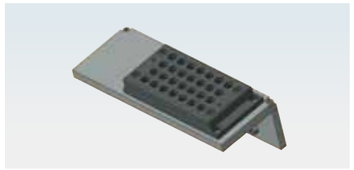
Electric Contact Block Connector Table

Contact block		Master side Tool side	Plug (Plugs made by DDK Inc.)		Shape	Cable clamp	
Servo module	SEA, B-M	Master side	D/MS3106A20-17S		Solid-shell S type	D/MS3057-12A	motor
			D/MS3106B20-17S		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-17S		Divided-shell L type	D/MS3057-12A	
		Master side	D/MS3106A20-29S		Solid-shell S type	D/MS3057-12A	signal
			D/MS3106B20-29S		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-29S		Divided-shell L type	D/MS3057-12A	
	SEA, B-T	Tool side	D/MS3106A20-17P		Solid-shell S type	D/MS3057-12A	motor
			D/MS3106B20-17P		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-17P		Divided-shell L type	D/MS3057-12A	
		Tool side	D/MS3106A20-29P		Solid-shell S type	D/MS3057-12A	signal
			D/MS3106B20-29P		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-29P		Divided-shell L type	D/MS3057-12A	
	SEYA, B-M	Master side	D/MS3106A20-15S		Solid-shell S type	D/MS3057-12A	motor
			D/MS3106B20-15S		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-15S		Divided-shell L type	D/MS3057-12A	
		Master side	D/MS3106A20-29S		Solid-shell S type	D/MS3057-12A	signal
			D/MS3106B20-29S		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-29S		Divided-shell L type	D/MS3057-12A	
	SEYA, B-T	Tool side	D/MS3106A20-15P		Solid-shell S type	D/MS3057-12A	motor
			D/MS3106B20-15P		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-15P		Divided-shell L type	D/MS3057-12A	
		Tool side	D/MS3106A20-29P		Solid-shell S type	D/MS3057-12A	signal
			D/MS3106B20-29P		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-29P		Divided-shell L type	D/MS3057-12A	
	SEPA, B-M	Master side	D/MS3106A20-17S		Solid-shell S type	D/MS3057-12A	motor
			D/MS3106B20-17S		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-17S		Divided-shell L type	D/MS3057-12A	
		Master side	D/MS3106A20-29S		Solid-shell S type	D/MS3057-12A	signal
			D/MS3106B20-29S		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-29S		Divided-shell L type	D/MS3057-12A	
		Master side	D/MS3106A28-21S		Solid-shell S type	D/MS3057-16A	signal ×37
			D/MS3106B28-21S		Divided-shell S type	D/MS3057-16A	
			D/MS3108B28-21S		Divided-shell L type	D/MS3057-16A	
	SEPA, B-T	Tool side	D/MS3106A20-17P		Solid-shell S type	D/MS3057-12A	motor
			D/MS3106B20-17P		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-17P		Divided-shell L type	D/MS3057-12A	
		Tool side	D/MS3106A20-29P		Solid-shell S type	D/MS3057-12A	signal
			D/MS3106B20-29P		Divided-shell S type	D/MS3057-12A	
			D/MS3108B20-29P		Divided-shell L type	D/MS3057-12A	
		Tool side	D/MS3106A28-21P		Solid-shell S type	D/MS3057-16A	signal ×37
			D/MS3106B28-21P		Divided-shell S type	D/MS3057-16A	
			D/MS3108B28-21P		Divided-shell L type	D/MS3057-16A	
Electric signal module	J, B, C, D-M	Master side	JMSP-2116F-D		Straight type	No	
			JMLP-2116F-D		90 degree type	No	
	J, B, C, D-T	Tool side	JMSP-2116M-D		Straight type	No	
			JMLP-2116M-D		90 degree type	No	
	BN, B, C, D-M	Master side	WEBSP2119F-1-D		Straight type	No	
	BP, B, C, D-M	Master side	WEBSP2119F-1-D		Straight type	No	
	BD, B, C, D-T	Tool side	WEBSP2116M-1-D		Straight type	No	
	MC, D-M	Master side	D/MS3106A18-1S		Solid-shell S type	D/MS3057-10A	
			D/MS3106B18-1S		Divided-shell S type	D/MS3057-10A	
			D/MS3108B18-1S		Divided-shell L type	D/MS3057-10A	
	MC, D-T	Tool side	D/MS3106A18-1P		Solid-shell S type	D/MS3057-10A	
			D/MS3106B18-1P		Divided-shell S type	D/MS3057-10A	
			D/MS3108B18-1P		Divided-shell L type	D/MS3057-10A	
	MW A,B,C,D-T ※	Master side	D/MS3106 18-1S(D190)	CE02-18BS-S-D	Solid-shell straight type	CE3507-10A	
				CE-18BA-S-D	Solid-shell L type		
		Tool side	D/MS3106 18-1P(D190)	CE02-18BS-S-D	Solid-shell straight type	CE3507-10A	
				CE-18BA-S-D	Solid-shell L type		
Primary current module	WPC, D-M	Master side	D/MS3106A36-3S		Solid-shell S type	D/MS3057-24A	
			D/MS3106B36-3S		Divided-shell S type	D/MS3057-24A	
			D/MS3108B36-3S		Divided-shell L type	D/MS3057-24A	
	WPC, D-T	Tool side	D/MS3106A36-3P		Solid-shell S type	D/MS3057-24A	
			D/MS3106B36-3P		Divided-shell S type	D/MS3057-24A	
			D/MS3108B36-3P		Divided-shell L type	D/MS3057-24A	
	WSC, D-M	Master side	Connector-less (Wiring to terminal)				
	WSC, D-T	Tool side					

BL QUICK-CHANGE™ Options (Gun-Changer Series)

1.Electric signal modules

※ Weights are approximate

Type	QC model	Pictures	Spec. & weight	Features & Remarks
ES10M(T) EL10M(T)	GC-300A		5A (220V) ×10 ※0.8kg (M (T))	*EL10 has a LED lock/unlock indication: insertion method contact
ES28M(T) EL28M(T)	GC-300A	  (EL 10M & T shown above)	5A (220) ×28 ※0.9kg (M (T))	*EL28 has a LED lock/unlock indication: insertion method contact
ESC0T EMC0T	GC-300A		Tool side electric signal cover	*Protective or safety cover for master side electric signal module

2.Servo module

※ Weights are approximate

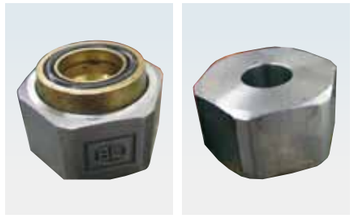
Type	QC model	Pictures	Spec. & weight	Features & Remarks
SC04M(T)	GC-300A		5A (220V) ×28 20A (500V) ×4 ※1.1kg (M (T))	*Insertion method contact
SC06M(T)	GC-300A	 (SM06M/SM06T shown above)	5A (220V) ×17 20A (500V) ×6 ※1.1kg (M (T))	*Insertion method contact

3.Fluid module

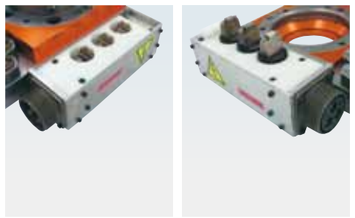
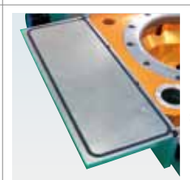
※ Weights are approximate

Type	QC model	Pictures	Spec. & weight	Features & Remarks
FD X X (M, T) No. of pneumatic ports No. of coolant ports	GC-300A	  (FD42M shown above, FD42T shown below)	FD02M (T) : ※1.8kg FD04M (T) : ※1.9kg FD06M (T) : ※2.0kg FD24M (T) : ※2.0kg FD42M (T) : ※2.0kg FD60M (T) : ※2.0kg	*Maximum of 6ports; coolant ports (self-sealing on master and tool sides) and pneumatic ports (self-sealing on master side. *Freely select any combination of coolant and pneumatic ports.

BL QUICK-CHANGE™ Options Table (Gun-Changer Series)

Type	QC model	Pictures	Spec. & weight	Features & Remarks
Socket plugs for coolant port	GC-300A		Discharge rate: 8ℓ per minute Effective cross-section area: 30.1mm²	
Socket plugs for pneumatic ports	GC-300A		Discharge rate: 9ℓ per minute Effective cross-section area: 33.9mm²	

4.Primary feed module

Type	QC model	Pictures	Spec. & weight	Features & Remarks
PC3CM(T)	GC-300A		200A (25% use rate) 100A continuous duty (600V) , 63KVA 5A (220V) ×3 approx. 2.0kg approx. (2.0kg)	*Contact for thermo-signal *Support #1 contact
PC3DM(T)	GC-300A		200A (42% use rate) 130A continuous duty (600V) , 81KVA approx. 2.1kg approx. (1.8kg)	*Support #0 contact
PC3EM(T)	GC-300A		200A (42% use rate) 130A continuous duty (600V) , 81KVA approx. 2.0kg approx. (1.7kg)	*NIPOSEAL connector *Waterproof seal *Crimping terminal (M8) connection
PCC0T	GC-300A-T	 (Installation example)	Tool side primary feed cover	Safety cover not attached to primary current module when Gun/Hand combination used.

QUICK-CHANGE™ Options (Gun-Changer Series)

Module Connector Table

Contact block	Master side Tool side	Plug (Plugs made by DDK Inc.)	Shape	Cable clamp
Electric signal module ES10M(GC-300A)	Master side	D/MS3106B28-16S	Divided-shell S type	D/MS3057-16A
		D/MS3108B28-16S	Divided-shell L type	D/MS3057-16A
Electric signal module ES10T(GC-300A)	Tool side	D/MS3106B28-16P	Divided-shell S type	D/MS3057-16A
		D/MS3108B28-16P	Divided-shell L type	D/MS3057-16A
Electric signal module ES28M(GC-300A)	Master side	D/MS3106B28-15S	Divided-shell S type	D/MS3057-16A
		D/MS3108B28-15S	Divided-shell L type	D/MS3057-16A
Electric signal module ES28T(GC-300A)	Tool side	D/MS3106B28-15P	Divided-shell S type	D/MS3057-16A
		D/MS3108B28-15P	Divided-shell L type	D/MS3057-16A
Servo module (signal) SC04M(GC-300A)	Master side	D/MS3106B28-15S	Divided-shell S type	D/MS3057-16A
		D/MS3108B28-15S	Divided-shell L type	D/MS3057-16A
Servo module (signal) SC04T(GC-300A)	Tool side	D/MS3106B28-15P	Divided-shell S type	D/MS3057-16A
		D/MS3108B28-15P	Divided-shell L type	D/MS3057-16A
Servo module (motor) SC04M(GC-300A)	Master side	D/MS3106B20-4S	Divided-shell S type	D/MS3057-12A
		D/MS3108B20-4S	Divided-shell L type	D/MS3057-12A
Servo module (motor) SC04T(GC-300A)	Tool side	D/MS3106B20-4P	Divided-shell S type	D/MS3057-12A
		D/MS3108B20-4P	Divided-shell L type	D/MS3057-12A
Servo module (signal) SC06M(GC-300A)	Master side	D/MS3106B20-29S	Divided-shell S type	D/MS3057-12A
		D/MS3108B20-29S	Divided-shell L type	D/MS3057-12A
Servo module (signal) SC06T(GC-300A)	Tool side	D/MS3106B20-29P	Divided-shell S type	D/MS3057-12A
		D/MS3108B20-29P	Divided-shell L type	D/MS3057-12A
Servo module (motor) SC06M(GC-300A)	Master side	D/MS3106B20-17S	Divided-shell S type	D/MS3057-12A
		D/MS3108B20-17S	Divided-shell L type	D/MS3057-12A
Servo module (motor) SC06T(GC-300A)	Tool side	D/MS3106B20-17P	Divided-shell S type	D/MS3057-12A
		D/MS3108B20-17P	Divided-shell L type	D/MS3057-12A
Primary current module PC3CM(GC-300A)	Master side	D/MS3106B36-3S	Divided-shell S type	D/MS3057-24A
		D/MS3108B36-3S	Divided-shell L type	D/MS3057-24A
Primary current module PC3CT(GC-300A)	Tool side	D/MS3106B36-3P	Divided-shell S type	D/MS3057-24A
		D/MS3108B36-3P	Divided-shell L type	D/MS3057-24A
Primary current module PC3DM(GC300A)	Master side	D/MS3106B36-5S	Divided-shell S type	D/MS3057-24A
		D/MS3108B36-5S	Divided-shell L type	D/MS3057-24A
Primary current module PC3DT(GC-300A)	Tool side	D/MS3106B36-5P	Divided-shell S type	D/MS3057-24A
		D/MS3108B36-5P	Divided-shell L type	D/MS3057-24A

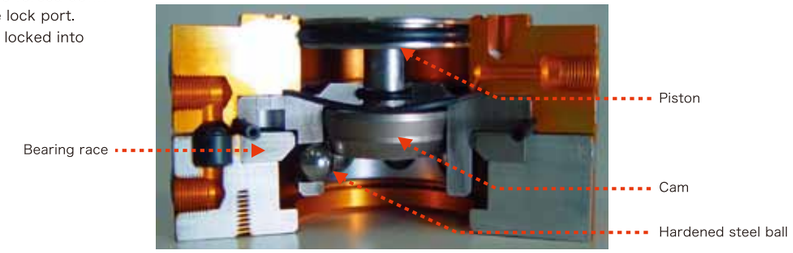
MEMO

Coupling and Uncoupling Mechanism

The BL Quick-Change has a superior fail-safe locking mechanism, and the Master and Tool plate will not separate even if locking air pressure is shut off. When lock air pressure is supplied, the ball-locking mechanism enables coupling force of 10 times or more of load capacity. And the BL Quick-Change maintains positional repeatability at specified levels, even after one million operating cycles under normal operating conditions.

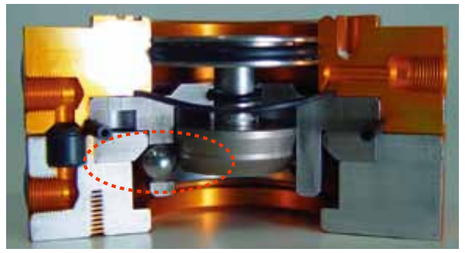
1. Uncoupled state (unlocked)

The piston and cam are forced down by supplying air to the lock port.
The steel balls are not locked into place.



2. Coupling

The piston and cam are forced down by supplying air to the lock port.
The steel balls are pushed out by the cam's first taper.



3. Coupled (locked)

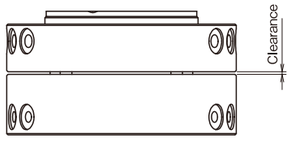
The Master and Tool plate lock together by the coupling force created
when the cam's second taper presses against the steel balls.

4. Fail-safe mode

The ball remains in the locking ring of the Tool plate.
The Tool plate cannot be separated from the Master plate
until air pressure is again supplied to the unlock port.

【Recovery method】
In reference to the 'coupling method' on the next page, after unlocking operation, return to normal coupling state by carrying out locking operation.

In fail-safe state, there is a slight clearance made between the Master Plate and the Tool Plate.

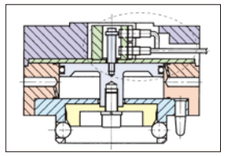


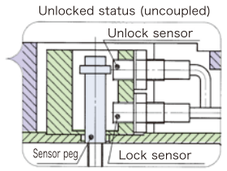
⚠ 【Attention】
Do not use the Quick-Change in the fall-safe mode (without locking pneumatic pressure). It may cause damage to surrounding equipment or to the Quick-Change.

Lock/Unlock Sensors

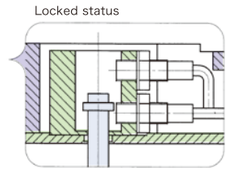
An optional lock/unlock sensor makes lock/unlock state confirmation available by two proximity sensors (built in interface plate) that detect the positions of dogs assembled on the piston. (The lock/unlock sensors of QCP-220, GIGA, and ZEUS models are built- in to the Master Plate.)

■Two-position detection lock/unlock sensor: Flex-40B、Flex-70A、QC-60D


Section view of Master plate

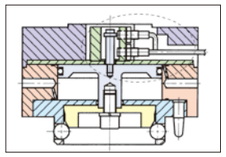


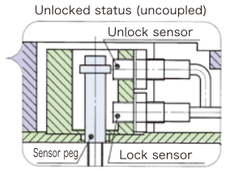
Unlock sensor：ON
Lock sensor：OFF



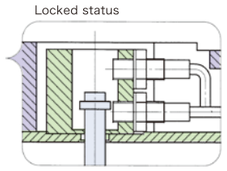
Unlock sensor：OFF
Lock sensor：ON

■Three-position detection lock/unlock sensor：QCP-100A、QC-150C、Flex-100B、Flex-300A、GC-300A

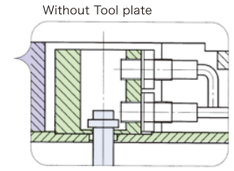

Section view of Master plate



Unlock sensor：ON
Lock sensor：OFF

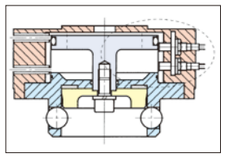


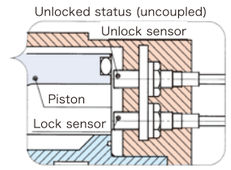
Unlock sensor：OFF
Lock sensor：ON



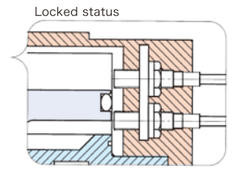
Unlock sensor：OFF
Lock sensor：OFF

■Three-position detection lock/unlock sensor：QCP-220、GIGA、(ZEUS)※

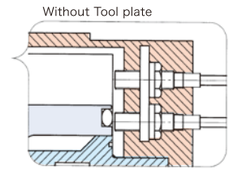

Section view of Master plate
ZEUS model is capable of 3-position lock/unlock state confirmation despite its structural difference from the above diagrams.



Unlock sensor：ON
Lock sensor：OFF

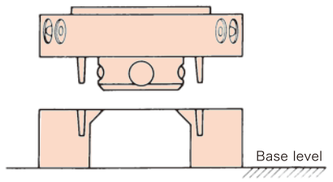


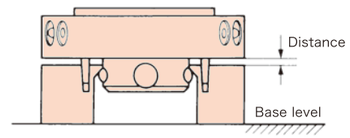
Unlock sensor：OFF
Lock sensor：OFF

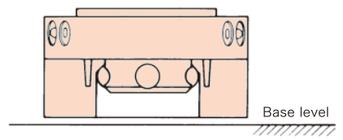


Unlock sensor：ON
Lock sensor：OFF

Coupling Sequence







Coupling

①Align the Mater plate just above the Tool plate. Release locking air and apply pressure through the unlock air port to retract the locking balls.

②Bring the Master plate down to a position slightly above the Tool plate. The two alignment pins in the Master plate enter the corresponding holes in the Tool plate, and the lower section of the steel locking ring in the Tool plate.

③elease unlock air pressure and apply air pressure through the lock air port. The Tool plate is raised and the two plates are coupled.

Uncoupling

④Raise the Master plate to completely separate it from the Tool plate.

⑤Release the lock air pressure and apply air pressure through the unlock air port to release the Tool plate.

⑥The two plates remain coupled while lock air pressure is applied. Position the Tool plate just above the storage rack.

Installation

1.Master plate installation

Using the predrilled holes, install the Master plate onto the robot interface plate (user supplied) with the bolts, O-ring, seal plate and locating pin provided.

> ⚠ **【Caution】**
> If the o-ring ring is damaged, please replace it. If the locating pin is not installed, you may not have the allowable static moment shown in the catalogue. Please use the locating pin.
> ※The Light-5A does not include seal plates.

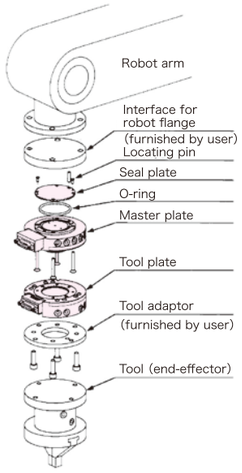
2.Tool plate installation

Install the Tool plate onto the tool adaptor plate (user supplied), using the pre-tapped holes.

> ⚠ **【Caution】**
> Please read the Installation and Maintenance Manual and refer to the description about bolt force and screw-torque.

Robot Installation

(Model:QC-20D)



(Note) A seal plate is not required on all models.

※Seal plate and O-ring are pre-assembled on models QC-10B, QC-20D, Flex-40B, QC-60D, Flex-70A, Flex-100B, QCP-100A, QC-150C, Flex-300A, USP-100A and GC-300A.

Notes

① We have various specifications for press-handling, deburring, etc. Please contact BL Autotec, Ltd. for details.
② Please contact BL Autotec, Ltd. regarding use under dusty, oily, moist or other special environments.
③ Do not connect pneumatic pressure for other utilities to the lock/unlock pneumatic pressure lines. Use a “Three-position exhaust center” when using a solenoid valve for lock/unlock. Please contact us before using a solenoid valve for other mechanisms.
④ Please contact BL Autotec, Ltd. for the details of specific applications.
⑤ A product serial number is labelled on each plate of the Quick-Change. Please provide BL Autotec, Ltd. with the serial number in case further assistance is required.

> ⚠ **【Caution】**
> When selecting a model, please refer to our technical documents and Installation and Maintenance Manuals.

Allowable positional error

Allowable positional error between the Master and Tool plates at the time of locking are shown below.
In conditions where the Tool plate and tool stand are not completely fixed, movement is generated.
When the Master Plate joins and couples with the Tool Plate, there is no function to correct positional errors.

1. Allowable positional error in the lateral direction (Figure 1)

Model	Allowable error *1	Allowable error
QC-1	±2.7mm	±3.0mm
Light-5A	±2.7mm	±3.0mm
QC-10B	±2.7mm	±3.0mm
QC-20D	±2.0mm	±2.7mm
Flex-40B	±2.5mm	±3.0mm
QC-60D	±3.3mm	±3.8mm
Flex-70A	±3.8mm	±4.5mm
Flex-100B, QCP-100A	±5.0mm	±5.5mm
QC-150C	±5.0mm	±5.5mm
QCP-220	±6.0mm	±6.5mm
ZEUS	±3.0mm	±6.5mm
GIGA	±6.0mm	±7.0mm
Flex-300A, GC-300A	±10.0mm	±11.0mm
USP-100A	±2.0mm	±2.5mm

Note) *1) Allowable positional errors indicate clearance made by the tapers of part A of the Master Plate and part B of the Tool Plate stated below.
*2) Maximum allowable error includes the clearance between parts C and D below.

2. Allowable positional error in the pitch direction (Figure 2)

Model	Allowable error
QC-1	θ = 0.5 deg
Light-5A	θ = 1.1 deg
QC-10B	θ = 1.1 deg
QC-20D	θ = 0.8 deg
Flex-40B	θ = 1.0 deg
QC-60D	θ = 0.6 deg
Flex-70A	θ = 0.5 deg
Flex-100B, QCP-100A	θ = 0.6 deg
QC-150C	θ = 0.7 deg
QCP-220	θ = 0.5 deg
ZEUS	θ = 0.5 deg
GIGA	θ = 0.3 deg
Flex-300A, GC-300A	θ = 0.6 deg
USP-100A	θ = 0.5 deg

Note) The BL Quick-Change uses a Tool plate lifting method and the numeric values above are at air pressure of 5 (kgf/cm2).

3. Allowable positional error in the rotational direction (Figure 3)

Model	Allowable error
QC-1	±3.5 deg
Light-5A	±5 deg
QC-10B	±4 deg
QC-20D	±5 deg
Flex-40B	±5 deg
QC-60D	±4 deg
Flex-70A	±4 deg
Flex-100B, QCP-100A	±4 deg
QC-150C	±4 deg
QCP-220	±2.5 deg
ZEUS	±1.5 deg
GIGA	±1.5 deg
Flex-300A, GC-300A	±4 deg
USP-100A	±2.5 deg

Note) The numeric values shown above are when the Master and Tool plates are coaxially positioned.

Figure 1 Flat surface positional error

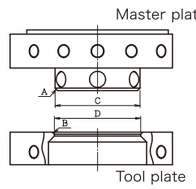


Figure 2 Pitch position

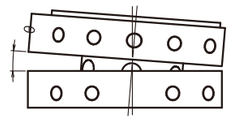
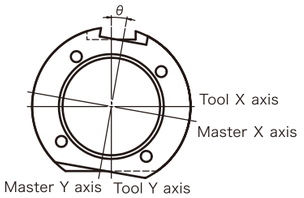


Figure 3 Rotational position error



Optimum clearance between plates for teaching

1. Coupling

【BL】QUICK-CHANGE uses a lifting method to couple the Master and Tool plates so it is not necessary to teach each plate. With clearance between the plates, the tool is lifted using air pressure supplied for coupling. Please refer to the tables below for optimum clearance between the Master and Tool plates when teaching.

2. Optimum clearance between plates

QC-1

【Tool weight】	【Plate clearance】
under 1kg	1.0mm or less

Light-5A

【Tool weight】	【Plate clearance】
under 2.5kg	1.5mm to 2.0mm
over 2.5kg	1.5mm

*Please set up a minimum clearance of 1mm or more by self-separating method.

QC-10B

【Tool weight】	【Plate clearance】
under 5kg	1.0mm or less
5 ～ 7.5kg	0.8mm or less
7.5kg 以上	0.7mm or less

QC-20D

【Tool weight】	【Plate clearance】
under 10kg	2.0mm or less
10 ～ 15kg	1.5mm or less
over 15kg	1.0mm or less

QCE-40, Flex-40B

【Tool weight】	【Plate clearance】
under 20kg	2.0mm or less
20 ～ 30kg	1.5mm or less
30kg 以上	1.0mm or less

QC-60D

【Tool weight】	【Plate clearance】
under 30kg	2.0mm or less
30 ～ 45kg	1.5mm or less
over 45kg	1.0mm or less

Flex-70A

【Tool weight】	【Plate clearance】
under 35kg	2.0mm or less
35 ～ 50kg	1.5mm or less
over 50kg	1.0mm or less

*Please set plate clearance at 1.0mm or less regard-less of tool weight when using an approach sensor.

Flex-100B, QCP-100A

【Tool weight】	【Plate clearance】
under 50kg	4.0mm or less
50 ～ 75kg	3.0mm or less
over 75kg	2.0mm or less

*Please set plate clearance at 1.5mm or less regard-less of tool weight when using an approach sensor.

QC-150C

【Tool weight】	【Plate clearance】
under 75kg	4.0mm or less
75 ～ 115kg	3.0mm or less
115kg 以上	2.0mm or less

QCP-220

【Tool weight】	【Plate clearance】
under 50kg	4.0mm or less
50 ～ 110kg	3.0mm or less
over 110kg	2.0mm or less

*Please set plate clearance at 1.0mm or less regard-less of tool weight when using an approach sensor.

Flex-300A, GC-300A

【Tool weight】	【Plate clearance】
under 150kg	0.4mm or less
150 ～ 225kg	0.3mm or less
over 225kg	0.2mm or less

*Please set plate clearance at 2.5mm or less regard-less of tool weight when using an approach sensor.

USP-100A

【Tool weight】	【Plate clearance】
under 25kg	2.0mm or less
25 ～ 50kg	1.5mm or less
over 50kg	1.0mm or less

ZEUS

【Tool weight】	【Plate clearance】
0～230kgf	2.0mm or less
(When utilizing the approach sensor(s))	
0～230kgf	1.0mm or less

GIGA

【Tool weight】	【Plate clearance】
under 250kg	6.0mm or less
250 ～ 375kg	4.0mm or less
375 ～ 500kg	3.0mm or less
over 500kg	2.5mm or less

*Please set plate clearance at 1.0mm or less regard-less of tool weight when using an approach sensor.

Note 1) Optimum clearance between plates is at air pressure of 0.49Mpa (5kgf/cm2) for coupling.
2) The center of gravity of the end-effectors should be below the projection plane of the Tool plate for optimum clearance between the plates.
3) Please refer to the instruction Manual for use with an approach sensor.

Cautions prior to use

BL Quick Change is a device for automatic tool changing, designed to be installed on industrial robot wrists. Please read the instruction manual thoroughly for proper use before operating and also refer to the industrial robot instruction manual.

- ●Do not allow compressed air into QUICK-CHANGE through its air pressure port before installation, as all or part of the product may be blown off resulting in product damage or operator injury.
- ●Do not allow compressed air into the unlock port of Model QC-10B prior to installation on the robot, as a hazardous piston blow-out may occur. Do not press the Master Plate piston to extend beyond the install surface. Repairs will be necessary if the steel balls are pushed out of the cylinder.
- ●Do not connect electricity to the QUICK-CHANGE before installation, as this could cause an electric shock to operators, an electrical short or result in product damage.
- ●Do not use QUICK-CHANGE in fail-safe mode (when air pressure is not connected), as this may damage the device or peripheral equipment.
- ●Use QUICK-CHANGE only within the specified limits, confirming load capacity, bending direction, torsional direction and composite moment. Otherwise, an incomplete or loose fit between the Master Plate and Tool Plate may occur.
- ●Do not use QUICK-CHANGE in areas exposed to dust, swarf, etc., as these conditions may cause a shortened service life or a degradation of electric contact integrity.
- ●Do not supply air or electricity from the robot to the tool during the couple/uncouple sequence. It may interfere with coupling/uncoupling and may damage the device or peripheral equipment.
- ●When you check or provide maintenance to Quick Change, please turn the Robot off and stop the supply of air pressure. Always follow the safety precautions specified in the Robot instruction manual. Otherwise, unexpected action or movement by the Robot may cause serious injury.。
- ●Whenever detaching the Master Plate from the Robot, place the Tool Plate on the tool stand and discharge any remaining air pressure before detaching. Otherwise, parts or all of the products may be blown off, resulting in injury.
- ●Please use QUICK-CHANGE in conjunction with Master and Tool Plates manufactured by BL Autotec, Ltd. BL Autotec, Ltd. is not responsible for and does not warrant damage or breakage to QUICK-CHANGE if used in conjunction with plates not manufactured by us.

Periodic Inspection

- ●Detach the Tool Plate and place it on the Tool stand. Set the Master Plate piston to the unlock position. Please check that balls move smoothly and for adherence of grease. If the balls do not move smoothly, clean the balls and cylinder with a clean brush or cloth, and apply new grease.

About Tool Stand

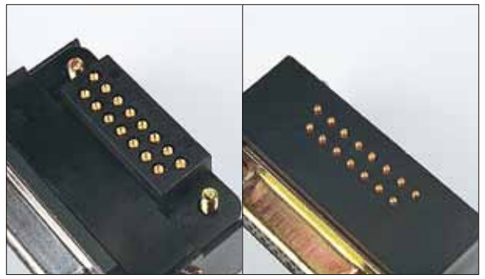
- ●Please design loose locating tolerance theTool plate and the tool stand (refer page 59 for positional error allowance).
  If the locating tolerance is too tight, the locating pin of the Quick Change or the tool stand may be damaged in case of large load.

●Commercial manufacturers

Product name	Application	Model, Specification	Manufacturer
Stepped parallel pin	Master Plate and Robot Adaptor	Please refer to the instruction manual for each model.	MISUMI CORPORATION http://www.misumi.co.jp
	Tool Plate and Tool Adaptor		
Adhesive for screws	Contact block cover screws	ThreeBond 1401	ThreeBond Co., Ltd. http://www.threebond.co.jp
	Master Plate screws	Loctite 222	Henkel Japan Ltd. http://www.henkel.com
Grease	O-ring lubrication	G-30 M	Shin-Etsu Chemical Co., Ltd. http://www.shinetsu.co.jp
	Steel ball lubrication	Defric Grease UTLM-10	Kawamura Research Laboratories. info@KRL.co.jp

QUICK-CHANGE Types of electrical contacts

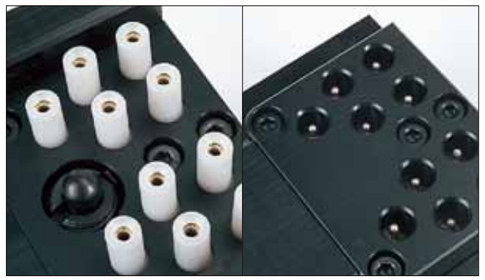
Electrical probe contacts



Master side Tool side

Master side Tool side

Electrical insertion contacts



Master side Tool side

⚠ Connecting electric signals

Electric signal modules, such as J16A, D15 and D37, have touch-point connecting surfaces, using a contact probe method. Do not use real-time reduced wiring or servo-encoder connections, or use a plug-in type like M10A if necessary.
Please contact us for further information.

Custom Quick-Change

BL AUTOTEC, LTD. can design BL QUICK-CHANGE™ for special applications based on non-standard customer requirements. Please contact us for detailed specifications.

■Improved proof moment characteristic specification

Model: Based on QC-10

Curvic-type coupling mechanism for improved proof moment characteristic

■Clean room specification

Model: Based on QC-20

Clean room specification with a vacuum port for dust collection so that dust will not disperse

■Deburring specification

Model: Based on QC-20

Dusty environment specifications with a perimeter seal.

■Large error correction specification

Model: Based on QC-20

Dependable coupling, even with large positional deviation at the approach

■Dust- and drip-proof specification

Model: Based on QC-20

Specification with a seal around the circuit makes application in environments with coolant and dust possible.

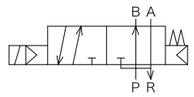
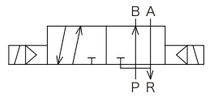
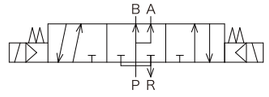
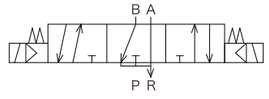
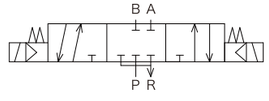
Usage examples of custom specifications

- Semiconductor manufacturing process
- Exchange of self-propelled robot hands
- Multi-joint robots in deburring systems
- Loading/unloading for NC machine tools
- Removal robots for injection mold equipment
- Exchange of die cast mold sprays

BL can manufacture to customer requirements.

Solenoid Valve Selection

Selection of solenoid valve for coupling and uncoupling BL QUICK-CHANGE
(Conditions: Pneumatic pressure is continuously supplied and electric supply is shut out)
Secure pneumatic pressure supply independent from utility pneumatic pressure supply. If shared with utility, it may be insufficient for intended flow rate.

	Type of Solenoid Valve	Advantage	Caution
◎	2-position Single 	1. Maintains complete locking even if the power is shut off. 2. Less cost and less wiring.	1. Requires wiring and programming for off-to-lock when the power is OFF. 2. May lock unexpectedly if the power is shut OFF during unlocking operation.
○	2-position Double 	1. Maintains complete locking even if the power is shut off. 2. Maintains previous state when the power is shut off.	1.The valve switch position is not identifiable before the power is on. (Air pressure may be supplied even during the unlocking operation.)
△	3-position Pressure Center 	1.The Tool Plate will not drop for a long period of time, even if the solenoid valve is spent (to the extent of internal leakage). (Note) : Not available for use on Light-5A	1.Actuates locking piston if the power is shut off during unlocking operation with air pressure applied.
△	3-position Exhaust Center 		1.Quick-Change holds the Tool Plate using the fail-safe function when the power is shut off. (There is a slight gap between the Master Plate and the Tool Plate in this state.)
×	3-position Closed Center 		1. The Tool Plate may drop after a long period of time if the solenoid valve is spent (to the extent of internal leakage).

※ When air pressure supply is stopped, the coupling state moves to fail-safe. There is a slight gap between the Master Plate and the Tool Plate but the Tool Plate is not dropped.
※ Do not leave in the fail-safe mode for a long time and do not operate in the fail-safe mode.
※ If reverse-pressure enters the exhaust port of the solenoid valve, there is a risk that the Quick Change will unlock and drop the Tool Plate. Individual exhaust is recommended.
※ Please plumb the A port of the solenoid valve to the unlock port of Quick Change and the B port of the solenoid valve to the lock port of Quick Change.
※ For details, please contact BL Autotec, Ltd.