

Series Compatible with Secondary Batteries

Material restriction

90-series

Restrictions

Material: Copper metal, Nickel, Zinc, Stainless steel 316
Surface treatment: Nickel plating, Zinc chromate

- Mounting dimensions are the same as those of the standard series.

Improved service life

91-series

- Service life has been improved with a lubricant retainer.
- Compatible with a low dew point (-40°C).

For use in dusty environment

91-□-XC4 series

- Dustproofing has been improved with a lubricant retainer and heavy-duty scraper.

Service life (Environmental resistance)

Standard

90-series

91-□-XC4
series

91-series

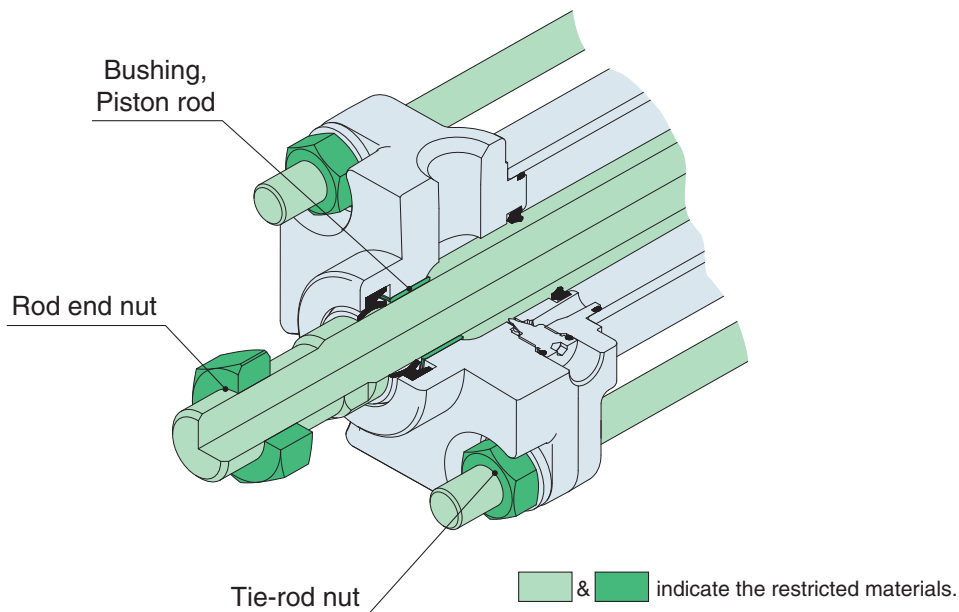
Contaminant countermeasures (Cleanliness level)

Compatible with
main products to terminal devices



Material restriction 90- series

Materials used for sliding parts, body mounting parts, and maintenance parts are restricted. Mounting dimensions are the same as those of the standard series.

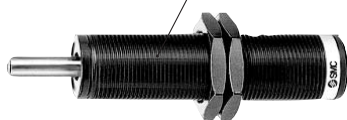


Related Products

Shock Absorber

The outer tube surface treatment has been changed to Raydent® treatment.

Change of outer tube surface treatment



90-RB series

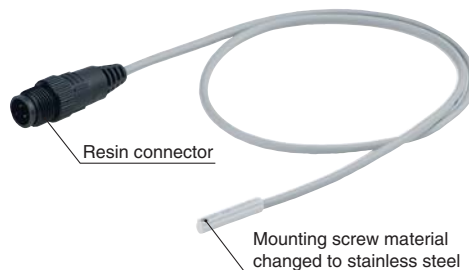
Floating Joint



90-JA series

Auto Switch

The connector material of the auto switch with pre-wired connector has been changed to resin, and the auto switch mounting screw material has been changed to stainless steel.



Resin connector

Mounting screw material changed to stainless steel

D-M9BWS DPC-900 series

* The lead wires and connector pins are made of copper.

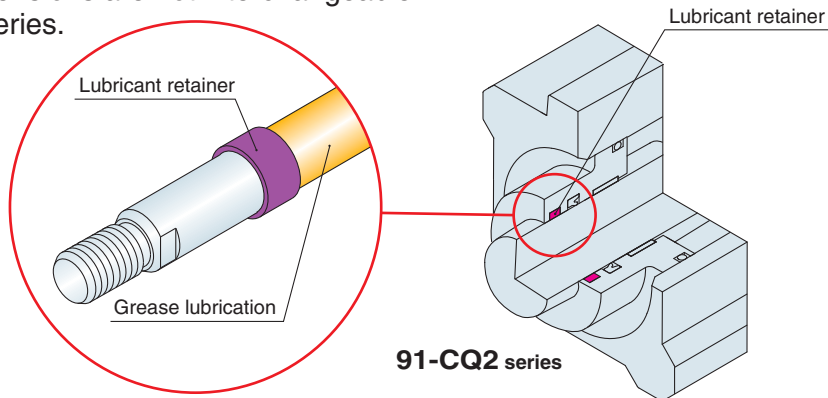
Improved service life 91-series

Material restriction + Lubricant retainer

Service life has been improved with a lubricant retainer compared with SMC's standard models. Compatible with a low dew point (-40°C).

Air Cylinder

Mounting dimensions are not interchangeable with the 90-series.



For use in dusty environment 91-□-XC4 series

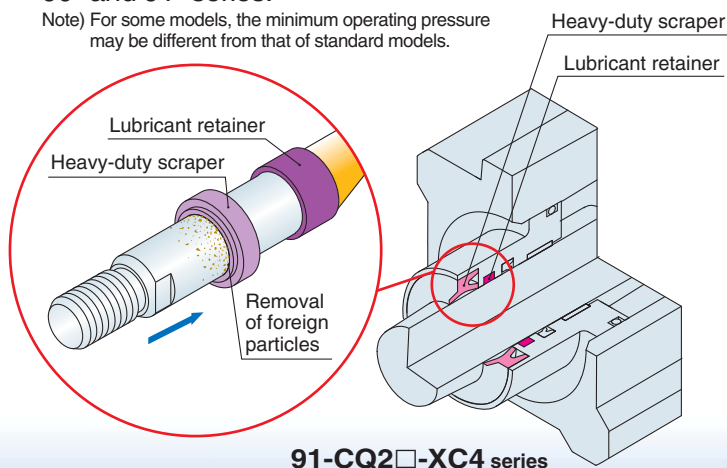
Material restriction + Lubricant retainer + Heavy-duty scraper

Dustproofing has been improved with a lubricant retainer and heavy-duty scraper.

Air Cylinder

Mounting dimensions are not interchangeable with the 90- and 91-series.

Note) For some models, the minimum operating pressure may be different from that of standard models.



Mounting Dimension Comparison

90-spec.

Mounting dimensions are the same as those of standard models.

5 to 7 mm longer

Lubricant retainer

91-spec.

3 to 5 mm longer

Lubricant retainer

Heavy-duty scraper

91-XC4 spec.

90- series

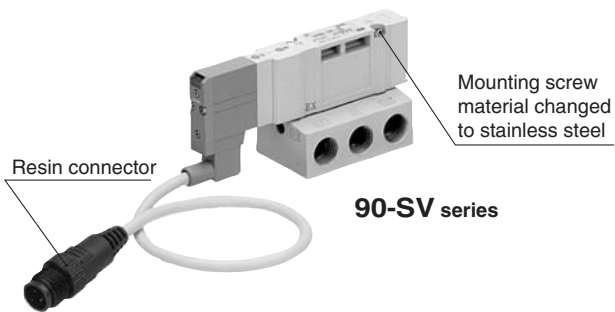
Pneumatic equipment material restriction

Materials used for sliding parts, body mounting parts, and maintenance parts are restricted. Mounting dimensions are the same as those of the standard series.

* Coils for solenoid valves, connector pins, and lead wires are made of copper.

Solenoid Valve

Changed to with resin pre-wired connector



Mounting screw material has been changed to stainless steel.



Mist Separator

Mounting screw material has been changed to stainless steel.



Regulator

Valve (wetted parts) material has been changed to stainless steel.



Pressure Switch

Changed to with resin pre-wired connector



Fittings/Speed Controller

Stainless steel specifications (Stainless steel 303)



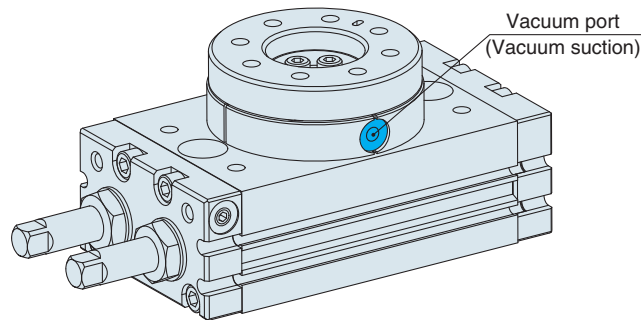
92-MSQB series (Available as a special order)

Material restriction + Vacuum port for vacuum suction

Using a vacuum port for vacuum suction enables reducing more dust particles than 90- series.

Rotary Actuator

A vacuum port for vacuum suction has been added to reduce the number of dust particles being emitted from the bearing part.



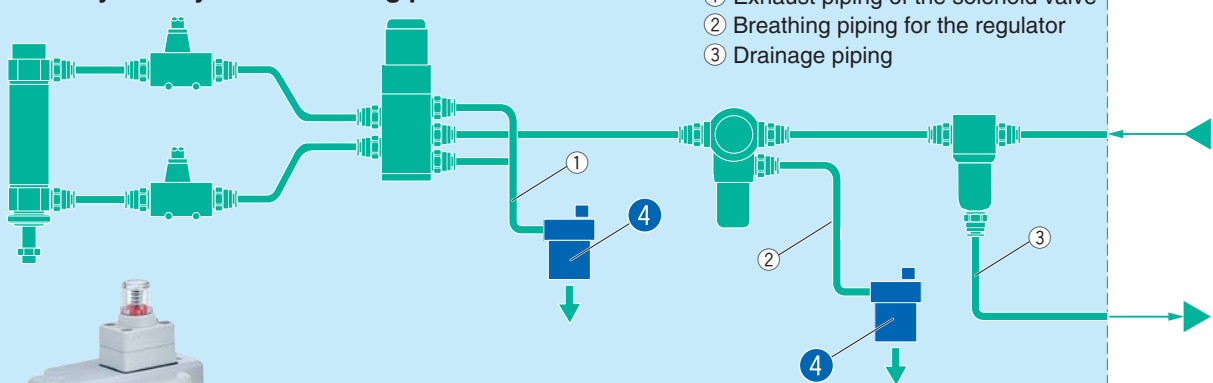
92-MSQB series

Recommended System Circuit for the Secondary Battery Manufacturing Process

When the pneumatic equipment is used in the secondary battery manufacturing process, the system circuit shown below is recommended for dust particle generation countermeasures.

Recommended System Circuit

Secondary battery manufacturing process



- ① Exhaust piping of the solenoid valve
- ② Breathing piping for the regulator
- ③ Drainage piping


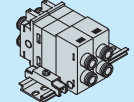






4 Clean Exhaust Cleaner/90-AMP series

Exhaust air treatment from solenoid valves and regulators







When exhaust air from the solenoid valve or the relief port/bleed hole of the regulator enters the clean exhaust cleaner (90-AMP series), it can prevent dust particles from being emitted.

Directional Control Valves

Description	Series	90-	Remarks
 5 Port Solenoid Valve	SV2000, 4000	●	
 Separate Type Double Check Block	VQ1000, 2000	●	
 VP342, 542	VP342, 542	●	
 3 Port Solenoid Valve	VT317	●	
 VG342	VG342	●	
 Finger Valve	VHK2	●	

* The 91-, 91-□-XC4 and 92- series are not available for directional control valves.

Actuators

Description		Series	90-	91-	91-XC4 (Available as a special order)	Remarks
	Standard (Double acting only)	CDJ2	● ^{*1}	—	—	ø10, 16
	Air Cylinder Standard (Double acting only)	CDG1□N	●	●	● ^{*3}	ø20 to 50
	Standard	CDA2	●	●	●	ø40 to 100
	Free Mount Cylinder Standard	CDU	●	●	● ^{*2}	ø10 to 32
	Free Mount Cylinder Non-rotating rod	CDUK	● ^{*1}	● ^{*5}	● ^{*2}	ø10 to 32
	Compact Cylinder Standard (Double acting only)	CDQS	●	●	● ^{*4}	ø12 to 25

* Refer to the auto switches listed on the back page for the models that can be mounted on actuators.
** Please contact SMC for the 92- series.

*1 Please contact SMC for the 90- series.
*2 Not compatible with ø10 and ø16.
*3 Not compatible with ø20 and ø25.
*4 Not compatible with ø12 and ø16.
*5 Not compatible with ø10.





Actuators

Description			Series	90-	91-	91-XC4 (Available as a special order)	Remarks
	Compact Cylinder	Anti-lateral load (Double acting only)	CDQS□S	●	●	—	ø12 to 25
		Standard (Double acting only)	CDQ2	●	●	●*3	ø12 to 100
		Basic	MY1B	●	●	—	ø20 to 63
	Mechanically Jointed Rodless Cylinder	Linear guide 1-axis	MY1H	●	●	—	ø16 to 40
		Linear guide 1-axis	MY2H	●	●	—	ø16, 25
	Magnetically Coupled Rodless Cylinder	Basic	CY3B	●*1	●	—	ø15 to 40
		Direct mount	CY3R(G)	●*1	●	—	ø15 to 40
	Air Slide Table	Cross roller guide	MXS	●	●	●	ø16, 20, 25 (Basic only)
		Recirculating linear guide	MXQ	●	●	●	ø6 to 25 (Basic only)
	Compact Guide Cylinder	Slide bearing	MGPM	●	●	●*3	ø12 to 63
		Ball bushing bearing	MGPL	●	●	●*3	ø12 to 63
	Guide Cylinder	Ball bushing bearing	MGGL	●	●	●	ø20 to 50
	Cylinder with Lock	Standard	CDNG□N	●*1	●	●*2	ø20 to 40

* Refer to the auto switches listed on the back page for the models that can be mounted on actuators.
 ** Please contact SMC for the 92- series.

*1 Please contact SMC for the 90- series.
 *2 Not compatible with ø20 and ø25.
 *3 Not compatible with ø12 and ø16.




Actuators

Description			Series	90-	91-	91-XC4 (Available as a special order)	Remarks
	Cylinder with Lock	Standard	CDNA□N	● *1	●	●	ø40 to 100
	Compact Cylinder with Lock	Standard (Double acting only)	CDLQ	● *1	●	●	ø20 to 100
	Stopper Cylinder	Standard	RSDQ	●	—	—	ø20 to 50
	Heavy Duty Stopper Cylinder	Standard	RSH	●	—	—	ø20, 32
		Standard	RS1H	●	—	—	ø50 to 63

* Refer to the auto switches listed on the back page for the models that can be mounted on actuators.


*1 Please contact SMC for the 90- series.

Related Products

Description			Series	90-	Remarks
		Standard	JA	●	ø80, 100
	Floating Joint	For compact cylinder	JB	●	ø12 to 100
		Stainless steel	JS	●	ø10 to 63
	Shock Absorber	Standard	RB	●	M8 to M27
		Standard	RBC	●	M8 to M27


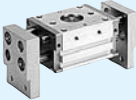


* The 91-, 91-□-XC4 and 92- series are not available for related products.

Rotary Actuator

Description			Series	92-	Remarks
	Rotary Table	Rack & Pinion	MSQB	●	Size: 20 to 100








* Refer to the auto switches listed on the back page for models that can be mounted on rotary actuators.

Air Grippers

Description			Series	90-	91-	91-XC4 (Available as a special order)	Remarks
		With dust cover	MHZJ2	●	—	—	ø10 to 25
		Long stroke (with dust cover)	MHZL2	●	—	—	ø10, 16, 20
	Parallel Type Air Gripper	Wide	MHL2	●	●	●	ø20, 25
		3-finger air gripper	MHS3	●	—	—	ø16, 20, 25
		4-finger air gripper	MHS4	●	—	—	ø16, 20, 25



* Refer to the auto switches listed on the back page for models that can be mounted on air grippers.

Vacuum Equipment

Description			Series	90-	Remarks
	Space Saving Vacuum Ejector & Vacuum Pump System	Ejector unit	ZQ	●	With connector cover
	Space Saving Vacuum Ejector & Vacuum Pump System	Manifold	ZZQ	●	With connector cover -X125: Port exhaust
	Vacuum Ejector	Body ported	ZH	●	
	Air Suction Filter	With one-touch fittings In-line	ZFC	—	Compatible with standard models
		Vertical vacuum entry (without buffer)	ZPT	●	Pad material: Fluororubber
	Vacuum Pad	Vertical vacuum entry (with buffer)	ZPT	●	Pad material: Fluororubber
		Pad	ZP	●	Mounting on a special adapter Pad material: Fluororubber



* The 91-, 91-□-XC4 and 92- series are not available for vacuum equipment.

Air Preparation Equipment

Description	Series	90-	Remarks
 Membrane Air Dryer	IDG50L to 100L	●	With fittings for purge air discharge
	Main Line Filter	●	Drain discharge is possible only manually.
	Mist Separator	●	Drain discharge is possible only manually.
	Micro Mist Separator	●	Drain discharge is possible only manually.




* The 91-, 91-□-XC4 and 92- series are not available for air preparation equipment.

Clean Air Filters

Description	Series	90-	Remarks
	SFD100	—	Compatible with standard models
	SFD200	●	
	AMP220, 320, 420	●	With element service indicator
	AMP420-06□-T-X1	●	With element service indicator [1500 ℓ/min (ANR)]

* The 91-, 91-□-XC4 and 92- series are not available for clean air filters.





Air Filters/Pressure Control Equipment

Description	Series	90-	Remarks
	Air Filter	●	Drain discharge is possible only manually.
	Mist Separator	●	Drain discharge is possible only manually.
	Micro Mist Separator	●	Drain discharge is possible only manually.
	AR25K to 60K	●	<ul style="list-style-type: none"> • With fitting for relief port • Order a pressure gauge separately.
	AW30K to 60K	●	<ul style="list-style-type: none"> • With fitting for relief port • Drain discharge is possible only manually. • Order a pressure gauge separately.

* The 91-, 91-□-XC4 and 92- series are not available for air filters and pressure control equipment.


* Please contact SMC for pressure gauges.

Air Filters/Pressure Control Equipment

Description		Series	90-	Remarks
	For Air Combination (Modular connection bracket)	Y30, 30T Y40, 40T	●	<ul style="list-style-type: none"> • Spacer • T-bracket spacer • For 30, 40 and 40-06
	Precision Regulator	IR1000 to 3000	●	Order a pressure gauge separately.
	Electro-Pneumatic Regulator	ITV2000	●	This is not completely copper-free since the electric circuit is included. (Wetted parts are copper-free.)
	Residual Pressure Indicator	CB-97XH	●	





* The 91-, 91-□-XC4 and 92- series are not available for air filters and pressure control equipment.
* Please contact SMC for pressure gauges.

Fittings/Flow Control Equipment



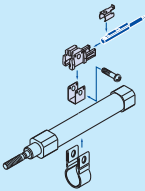
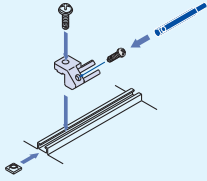
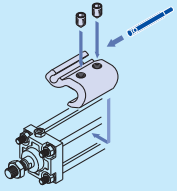
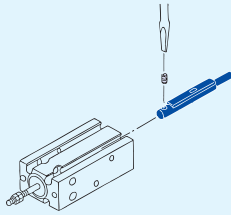
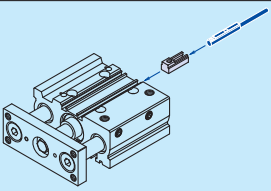

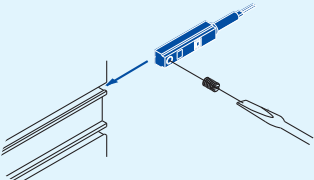

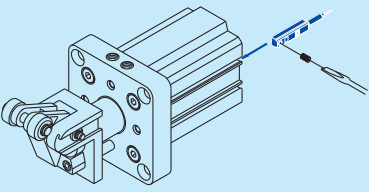
Description		Series	90-	Remarks
	Quick Exhaust Valve with Built-in One-touch Fittings	AQ240F, 340F	●	
	Check Valve with One-touch Fittings	AKH4 to 12	●	
	Speed Controller with One-touch Fittings Stainless Steel Specifications	AS-FG	—	Compatible with standard models
	One-touch Fittings Stainless Steel Specifications	KG	—	Compatible with standard models

* The 91-, 91-□-XC4 and 92- series are not available for fittings and flow control equipment.

Detection Switches

Description		Series	90-	Remarks
	High Precision Digital Pressure Switch	ZSE40/ISE40	●	With resin pre-wired connector
	General Purpose High Precision Digital Pressure Switch	ISE50	●	With resin pre-wired connector
	2-Color Display Digital Flow Switch	PFM	●	Note) Copper will be exposed when the connector cover moves.
	Digital Flow Switch for Water	PF2W	●	

* The 91-, 91-□-XC4 and 92- series are not available for detection switches.

Series	Applicable cylinder	Mounting	
2-Color Display Solid State Switch D-M9BWSGPC-900 D-M9BWVSDPC-900 D-M9BWL-900 D-M9BWVL-900  Reed Switch D-A90L-900 	CDJ2 series CDG1 series MGG series	Band mounting *1	
	CDQ2 series RSQ series	Rail mounting *1	
	*2 CDA2 series CDNA series	Tie-rod mounting *1	
	*2 CDU series CQ series MY series CY3R series RSQ series MSQ series MHZJ series *4 MHZL series *4 MHS series *4 MX series	Direct mounting (Round groove)	
	*3 MY series *3 CY3R series MGP series MLGP series RSH series MHL series *4	Direct mounting *1 (Square groove)	
2-Color Display Solid State Switch D-Y7BWL-900 D-Y7BWVL-900 	MY1B50 series	Direct mounting	
Reed Switch D-Z80L-900 	RSH series MY1B25 to 63	Direct mounting	

*1 Can be mounted on the products by using an auto switch mounting bracket. * The auto switch mounting bracket material is also restricted.

*2 The D-A90L-900 cannot be mounted on the RSH, RS1H, MY1B25 to 63, CDNA□50.

*3 The D-M9BW(V)□-900 cannot be mounted on the MY1B50.

*4 Reed switches (D-A90L-900 and D-Z80L-900) cannot be mounted on the MHZJ, MHZL, MHS, MHL series.

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D-DN

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