LEJ-SMY72EN

ORIGINAL INSTRUCTIONS

Instruction Manual

Refer to Declaration of Conformity for relevant Directives

Electric Actuator / High Rigidity Slider Type

Series LEJ

The intended use of this Electrical Actuator is to convert an electrical input signal into mechanical motion.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) *1), and other safety regulations.

*1) ISO 4414: Pneumatic fluid power - General rules relating to systems.
ISO 4413: Hydraulic fluid power - General rules relating to systems.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots -Safety. etc.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

⚠ **Caution**	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
⚠ **Warning**	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Danger**	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

⚠ Warning

- This is a Class A product and it must not be used in residential premises.
- Always ensure compliance with relevant safety laws and standards. All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

LEJS40 / 63 series – Ball screw drive Note8) Note9) Note10)

Model			LEJS40			LEJS63		
Actuator specification	Stroke [mm] Note1)		200,300,400,500,600, 700,800,900,1000, 1200			300,400,500,600, 700,800,900,1000, 1200,1500		
	Work load [kg] Note2)	Horizontal	15	30	55	30	45	85
		Vertical	3	5	10	6	10	20
	Speed [mm/s] Note3) Stroke range	0 to 500	1800	1200	600	1800	1200	600
		501 to 600	1580	1050	520	1800	1200	600
		601 to 700	1170	780	390	1800	1200	600
		701 to 800	910	600	300	1390	930	460
		801 to 900	720	480	240	1110	740	370
		901 to 1000	580	390	190	900	600	300
		1001 to 1100	480	320	160	750	500	250
		1101 to 1200	410	270	130	630	420	210
		1201 to 1300	-	-	-	540	360	180
		1301 to 1400	-	-	-	470	310	150
		1401 to 1500	-	-	-	410	270	130

2 Specifications - continued

Model			LEJS40			LEJS63		
Actuator specification	Maximum acceleration / deceleration [mm/s²]		20,000 (refer to catalogue for limit according to work load and duty rate)					
	Position repeatability [mm]	Basic type	±0.02					
		High precision type	±0.01					
	Lost motion [mm] Note4)	Basic type	0.1 or less					
		High precision type	0.05 or less					
	Lead [mm]		24	16	8	30	20	10
	Impact / Vibration resistance [m/s²] Note5)		50 / 20					
	Drive method		Ball screw					
	Guide type		Linear guide					
	Acceptable external resistance [N]		20					
	Operating temperature range [℃]		5 to 40					
	Operating humidity [%RH]		90 or less (no condensation)					
	Regenerative option		May be required by speed and work load. (refer to catalogue).					
Electrical	Motor output [W] / size [mm]		100 / □40			200 / □60		
	Type of Motor		AC servo motor					
Lock	Lock Type Note6)		No excitation operating type					
	Holding force [N] LEJS∗(S/T)∗ / LEJS∗V∗		67 / 67	101 / 101	203 / 202	220 / 108	330 / 162	660 / 324
	Power consumption [W] at 20℃ Note7) LEJS∗(S/T)∗ / LEJS∗V∗		6.3 / 5.5			7.9 / 6		
	Rated voltage [VDC]		24 +0 / -10%					

LEJS63–M series – Ball screw drive Note8) Note9) Note10)

Model			LEJS63∗-∗M		
Actuator specification	Stroke [mm] Note1)		790,890,990,1190,1490,1790		
	Work load [kg] Note2)	Horizontal	30	45	85
		Vertical	6	10	20
	Speed [mm/s]		1800	1200	600
	Maximum acceleration / deceleration [mm/s²]		20,000 (refer to catalogue for limit according to work load and duty rate.)		
	Position repeatability [mm]	Basic type	±0.02		
		High precision type	±0.01		
	Lost motion [mm] Note4)	Basic type	0.1 or less		
		High precision type	0.05 or less		
	Lead [mm]		30	20	10
	Impact / Vibration resistance [m/s²] Note5)		50 / 20		
	Drive method		Ball screw		
	Guide type		Linear guide		
	Acceptable external resistance [N]		20		
	Operating temperature range [℃]		5 to 40		
	Operating humidity [%RH]		90 or less (no condensation)		
	Regenerative option		May be required by speed and work load. (refer to catalogue).		
Electrical	Motor output [W] / size [mm]		200 / □60		
	Type of Motor		AC servo motor		
Lock	Lock Type Note6)		No excitation operating type		
	Holding force [N] LEJS∗(S/T)∗ / LEJS∗V∗		220 / 108	330 / 162	660 / 324
	Power consumption [W] at 20℃ Note7) LEJS∗(S/T)∗ / LEJS∗V∗		7.9 / 6		
	Rated voltage [VDC]		24 +0 / -10%		

Note1) Strokes other than the above are produced as a special order.
Note2) Details are shown in "Speed-Work load graph (indication)" of catalogue.
Note3) The allowable speed will be affected by the stroke length.
Note4) A reference value for correcting an error in reciprocal operation.
Note5) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester. In both axial and perpendicular direction to the lead screw (the test was performed with the actuator in the initial state).
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz, when the actuator was tested in both an axial and perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Note6) Only applies to actuators supplied with lock.
Note7) For the actuator with lock, please add the power consumption for the lock.
Note8) Sensor magnet position is located at the centre of the table.
Note9) Do not allow collisions at either end of the table travel range.
In addition, when running the positioning operation, do not set within 2 mm of either end.
Note10) Consult with SMC for the manufacture of intermediate strokes.
(Manufacturable stroke range LEJS40/200 up to 1200mm, LEJS63/300 up to 1500mm, LEJS63∗–∗M/790 up to 1790mm, LEJS100/300 up to 2500mm).

2 Specifications - continued

LEJS100 series – Ball screw drive Note8) Note9) Note10)

Model				LEJS100		
Actuator specification	Stroke [mm] Note1)			300,400,500,600,700,800,900,1000,		
	Horizontal work load [kg]		3000 (mm/s²)	60	150	400
			5000 (mm/s²)	43	93	150
			9800 (mm/s²)	22	36	-
	Vertical work load [kg]		3000 (mm/s²)	14	29	80
			5000 (mm/s²)	12	29	30
			9800 (mm/s²)	8	9	-
	Speed [mm/s]	Stroke range 0 to 800		2300	1250	500
		801 to 900		1900	950	380
		901 to 1000		1600	800	320
		1001 to 1100		1400	700	280
		1101 to 1200		1200	600	240
		1201 to 1300		1000	500	200
		1301 to 1500		900	450	180
		1501 to 1600		800	400	160
		1601 to 1700		700	350	140
		1701 to 1800		600	300	120
		1801 to 2000		500	250	100
		2001 to 2300		400	200	80
		2301 to 2500		300	150	60
	Maximum acceleration / deceleration [mm/s²]			9,800		
	Position repeatability [mm]			±0.01		
	Lost motion [mm] Note4)			0.05 or less		
	Lead [mm]			50	25	10
	Impact / Vibration resistance [m/s²] Note5)			50 / 20		
	Drive method			Ball screw		
	Guide type			Linear guide		
	Operating temperature [℃]			5 to 40		
	Operating humidity [%RH]			90 or less (no condensation)		
	Regenerative option			May be required by speed and work load. (refer to catalogue).		
Electrical	Motor output [W] / size [mm]			750 / □80		
	Type of Motor			AC servo motor		
Lock	Lock Type Note6)			No excitation operating type		
	Holding force [N]			240	480	1220
	Power consumption [W] at 20℃ Note7)			10		
	Rated voltage [VDC]			24 0 / -10%		

Note1) Strokes other than the above are produced as a special order.
Note2) Details are shown in "Speed-Work load graph (indication)" of catalogue.
Note3) The allowable speed will be affected by the stroke length.
Note4) A reference value for correcting an error in reciprocal operation.
Note5) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester. In both axial and perpendicular direction to the lead screw (the test was performed with the actuator in the initial state).
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz, when the actuator was tested in both an axial and perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Note6) Only applies to actuators supplied with lock.
Note7) For the actuator with lock, please add the power consumption for the lock.
Note8) Sensor magnet position is located at the centre of the table.
Note9) Do not allow collisions at either end of the table travel range.
In addition, when running the positioning operation, do not set within 2 mm of either end.
Note10) Consult with SMC for the manufacture of intermediate strokes.
(Manufacturable stroke range LEJS40/200 up to 1200mm, LEJS63/300 up to 1500mm, LEJS63∗–∗M/790 up to 1790mm, LEJS100/300 up to 2500mm).

Weight

Model	LEJS40									
Stroke [mm]	200	300	400	500	600	700	800	900	1000	1200
Weight (kg)	5.6	6.4	7.1	7.9	8.7	9.4	10.2	11.0	11.7	13.3
Lock weight (kg)	0.2 (S2) / 0.3 (S6) / 0.2 (T6)									

Model	LEJS63									
Stroke [mm]	300	400	500	600	700	800	900	1000	1200	1500
Weight (kg)	11.4	12.7	13.9	15.2	16.4	17.7	18.9	20.1	22.6	26.4
Lock weight (kg)	0.4 (S3) / 0.7 (S7) / 0.4 (T7)									

2 Specifications - continued

Model	LEJS63∗-∗M					
Stroke [mm]	790	890	990	1190	1490	1790
Weight (kg)	19.4	20.7	21.9	24.4	29.9	33.7
Lock weight (kg)	0.4 (S3) / 0.7 (S7) / 0.4 (T7)					

Model	LEJS100											
Stroke [mm]	300	400	500	600	700	800	900	1000	1200	1500	2000	2500
Weight (kg)	22.5	24.6	26.7	28.8	30.9	33.0	35.1	37.1	41.3	47.6	58.1	68.5
Lock weight (kg)	1.0											

LEJB series - Belt drive Note7) Note8) Note9)

Model			LEJB40	LEJB63
Actuator specification	Stroke [mm] Note1)		200,300,400,500, 600,700,800,900, 1000,1200,1500,2000	300,400,500,600, 700,800,900,1000, 1200,1500,2000,3000
	Work load [kg]	Horizontal	20 (10 for stroke above 1000 mm)	30
	Speed [mm/s] Note2)		2000	3000
	Maximum acceleration / deceleration [mm/s²]		20,000 (refer to catalogue for limit according to work load and duty rate)	
	Position repeatability [mm]		±0.04	
	Lost motion [mm] Note3)		0.1 or less	
	Lead [mm]		27	42
	Impact / Vibration resistance [m/s²] Note4)		50 / 20	
	Drive method		Belt drive	
	Guide type		Linear guide	
	Acceptable external resistance [N]		20	
	Operating temperature [℃]		5 to 40	
	Operating humidity [%RH]		90 or less (no condensation)	
	Regenerative option		May be required by speed and work load. (refer to catalogue).	

Model		LEJB40	LEJB63
Electrical	Motor output [W] /size [mm]	100 / □40	200 / □60
	Type of Motor	AC servo motor	
Lock	Lock Type Note5)	No excitation operating type	
	Holding force [N] LEJB∗(S/T)∗ / LEJB∗V∗	60 / 59	189 /77
	Power consumption [W] at 20℃ Note6) LEJB∗(S/T)∗/ LEJB∗V∗	6.3 / 5.5	7. 9 / 6
	Rated voltage [VDC]	24 +0 / -10%	

Note1) Strokes other than the above are produced as a special order.
Note2) Details are shown in "Speed-Work load graph (indication)" of catalogue.
Note3) A reference value for correcting an error in reciprocal operation.
Note4) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester. In both axial and perpendicular direction to the lead screw (the test was performed with the actuator in the initial state).
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz, when the actuator was tested in both an axial and perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Note5) Only applies to actuators supplied with lock.
Note6) For the actuator with lock, please add the power consumption for the lock.
Note7) Sensor magnet position is located at the centre of the table.
Note8) Do not allow collisions at either end of the table travel range.
In addition, when running the positioning operation, do not set within 2 mm of either end.
Note9) Consult with SMC for the manufacture of intermediate strokes.
(Manufacturable stroke range LEJB40/200 up to 2000mm, LEJB63/300 up to 3000mm)

Weight

Model	LEJB40											
Stroke [mm]	200	300	400	500	600	700	800	900	1000	1200	1500	200
Weight (kg)	5.7	6.4	7.1	7.7	8.4	9.1	9.8	10.5	11.2	12.6	14.7	18.1
Lock weight (kg)	0.2 (S2) / 0.3 (S6) / 0.2 (T6)											

Model	LEJB63											
Stroke [mm]	300	400	500	600	700	800	900	1000	1200	1500	2000	300
Weight (kg)	11.5	12.7	13.8	15.0	16.2	17.4	18.6	19.7	22.1	25.7	31.6	43.
Lock weight (kg)	0.4 (S3) / 0.7 (S7) / 0.4 (T7)											

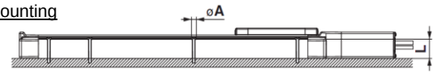
3 Installation

3.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.
- Do not use the product in excess of its allowable specification as listed in Section 2.
- When installing, inspecting or performing maintenance on the product, be sure to turn off the power supplies. Then, lock it so it cannot be tampered with while work is happening.
- Keep the flatness of the mounting surface to 0.1 mm maximum.
  Insufficient flatness of a work piece or actuator mounting surface can cause play in the guide and increased sliding resistance. In the case of overhang mounting (including cantilever), use a support plate or support guide to avoid deflection of the actuator body.
- When mounting the actuator, use all mounting holes.
  If all mounting holes are not used, this will not maintain the specified performance. e.g. the amount of displacement of the table will increase.
- When mounting the actuator, use screws with adequate length and tighten them with adequate torque.
  Tightening the screws with a torque higher than recommended may cause malfunction, whilst tightening with a torque lower than recommended can cause displacement of the mounting position, or in extreme conditions the actuator could become detached from its mounting position.

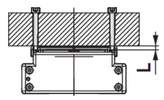
Actuator mounting



Model	Screw size	Maximum tightening torque (Nm)	A (mm)	L (mm)Note1)
LEJ*40	M5	3.0	ϕ5.5	36.5
LEJ*63	M6	5.2	ϕ6.8	49.5
LEJS100	M8 x 1.25	12.5	M8	16

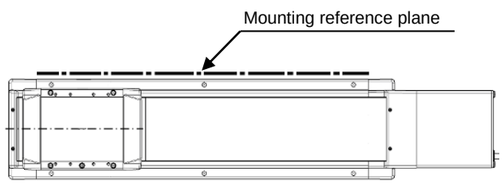
Note1) When A is M thread, L is thread depth.

Work piece mounting



Model	Screw size	Maximum tightening torque (Nm)	L (Maximum thread depth) mm
LEJ*40	M6 x 1	5.2	10
LEJ*63	M8 x 1.25	12.5	12
LEJS100	M8 x 1.25	12.5	16

- In order to prevent the work piece fixing screws from damaging the table, use screws at least 0.5 mm shorter than the maximum thread depth.
  Longer screws can hit the body and cause operation failure.
- When mounting the actuator using the body mounting reference plane, use a positioning pin.
  Set the height of the pin to be 5 mm or more because of R chamfering. (recommended height: 6 mm).



3 Installation - continued

3.2 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.
- Prevent foreign particles from entering the product.

3.3 Mounting

Warning

- Observe the required tightening torque for screws.
  Unless stated otherwise, tighten the screws to the recommended torque for mounting the product.
- Do not make any alterations to the product.
  Alterations made to this product may lead to a loss of durability and damage to the product, which can lead to injury and damage to other equipment and machinery.
- When an external guide is used, connect the moving parts of the product and the load in such a way that there is no interference at any point within the stroke.
  Do not scratch or dent the sliding parts of the table or mounting face etc., by striking or holding them with other objects. The components are manufactured to precise tolerances, so that even a slight deformation may cause faulty operation or seizure.
- Do not use the product until it has been verified that the equipment can be operated correctly.
  After mounting or repair, connect the power supply to the product and perform appropriate functional inspections to check it is mounted correctly.
- Do not use the product until it has been verified that the equipment can be operated correctly.
  After mounting or repair, connect the power supply to the product and perform appropriate functional inspections to check it is mounted correctly.
- Maintenance space
  Allow sufficient space for maintenance and inspection.

3.4 Lubrication

Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, refer to catalogue for details.
- The recommended grease is lithium grade No.2
  SMC grease packs are listed below.

Applied Region	Grease Pack Number	Weight [g]
Ball screw Guide Dust seal band	GR-S-010	10
	GR-S-020	20

3.5 Wiring

Warning

- Adjustment, mounting or wiring changes should not be carried out before disconnecting the power supply to the product.
  Electric shock, malfunction and damage can result.
- Do not disassemble the cables.
- Use only specified cables.
  Use only specified cables otherwise there may be risk of fire and damage.
- Do not connect or disconnect the wires, cables and connectors when the power is turned on.

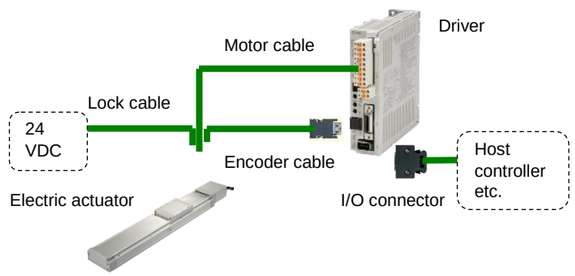
Caution

- Wire the connector correctly and securely.
  Check the connector for polarity and do not apply any voltage to the terminals other than those specified in the Operation Manual.

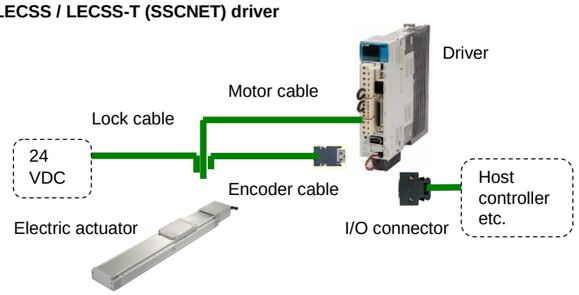
3 Installation - continued

- Take appropriate measures against noise.
  Noise in a signal line may cause malfunction. As a countermeasure separate the high voltage and low voltage cables, and shorten the wiring lengths, etc.
- Do not route input/output wires and cables together with power or high voltage cables.
  The product can malfunction due to noise interference and surge voltage from power and high voltage cables close to the signal line. Route the wires of the product separately from power or high voltage cables.
- Take care that actuator movement does not catch cables.
- Operate with all wires and cables secured.
- Avoid bending cables at sharp angles where they enter the product.
- Avoid twisting, folding, rotating or applying an external force to the cable.
  Risk of electric shock, wire breakage, contact failure and loss of control of the product can result.
- Select "Robotic cables" in applications where cables are moving repeatedly (encoder/ motor/ lock).
  Refer to the relevant operation manual for the bending life of the cable.
- Confirm correct insulation.
  Poor insulation of wires, cables, connectors, terminals etc. can cause interference with other circuits. Also there is the possibility that excessive voltage or current may be applied to the product causing damage.
- Refer to the auto switch references in "Best Pneumatics" when an auto switch is to be used

LECSA (Pulse input / Positioning) driver

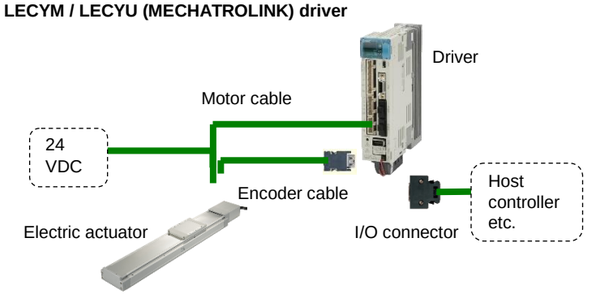


LECSB / LECSB-T (Pulse input) driver
LECSC / LECSC-T (CC-Link) driver
LECSS / LECSS-T (SSCNET) driver



3 Installation - continued

LECYM / LECYU (MECHATROLINK) driver



3.6 Operating precautions

- Do not touch the motor whilst it is in operation. The surface temperature can increase to approximately 80°C. Energising alone can also increase the temperature of the product. These temperatures can cause burns.
- If the product is overheating, smoking or has caught fire, immediately shut the power supply off.
- If the product emits abnormal noise or vibrations, the product should be immediately stopped and inspected as it may be mounted incorrectly, otherwise it can seriously damage the product.
- Do not touch rotating parts of the motor or moving parts of the actuator while in operation.

4 How to Order

- For standard products, refer to the catalogue for the how to order information.
- For special products, which include a suffix of "-X*", "-DC*" or "-DK*", then please refer to the customer drawing of that specific product.

5 Outline Dimensions (mm)

- For standard products, refer to the catalogue for outline dimensions.
- For special products, which include a suffix of "-X*", "-DC*" or "-DK*", then please refer to the customer drawing of that specific product.

6 Maintenance

6.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Incorrect handling can cause an injury, damage or malfunction of the equipment and machinery, so ensure that the procedure for the task is followed.
- Always allow sufficient space around the product to complete any maintenance and inspection.

6 Maintenance - continued

6.2 Periodical Maintenance

- Maintenance should be performed according to the table below:

	Appearance Check	Belt Check
Inspection before daily operation	✓	
Inspection every six months*	✓	✓
Inspection every 1,000km*	✓	✓
Inspection every 5 million cycles*	✓	✓

**whichever of these occurs first.*

- Following any maintenance, always perform a system check. Do not use the product if any error occurs, as safety cannot be assured if caused by any un-intentional malfunction.

6.3 Appearance Check

- The following items should be visually monitored and ensure that the cylinder remains in good condition and there are no concerns flagged;
  - Loose Screws,
  - Abnormal level of dust or dirt,
  - Visual flaws/faults,
  - Check the cable connections,
  - Abnormal noises or vibrations,

6.4 Belt Check

- If one of the 6 conditions below are seen, do not continue operating the cylinder, contact SMC immediately.
  - **Tooth shaped canvas is worn out.**
    Canvas fibre becomes “fuzzy”, rubber is removed, and the fibre gains a white colour. The lines of fibre become very unclear.

  - **Peeling off or wearing of the side of the belt.**
    The corner of the belt becomes round and frayed, with threads beginning to stick out.

  - **Belt is partially cut.**
    Belt is partially cut. Foreign matter could be caught in the teeth and cause flaws.

  - **Vertical line of belt teeth.**
    Flaw which is made when the belt runs on the flange.
  - **Rubber back of the belt is softened and sticky.**
  - **Crack on the back of the belt.**

7 Limitations of Use

7.1 Limited warranty and Disclaimer/Compliance Requirements

- Refer to Handling Precautions for SMC Products.

8 Product disposal

This product should not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

9 Contacts

Refer to www.smcworld.com or www.smc.eu for contacts.

SMC Corporation

URL : http// www.smcworld.com (Global) http// www.smceu.com (Europe)
'SMC Corporation, Akihabara UDX15F, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101 0021

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