SERVICE MANUAL

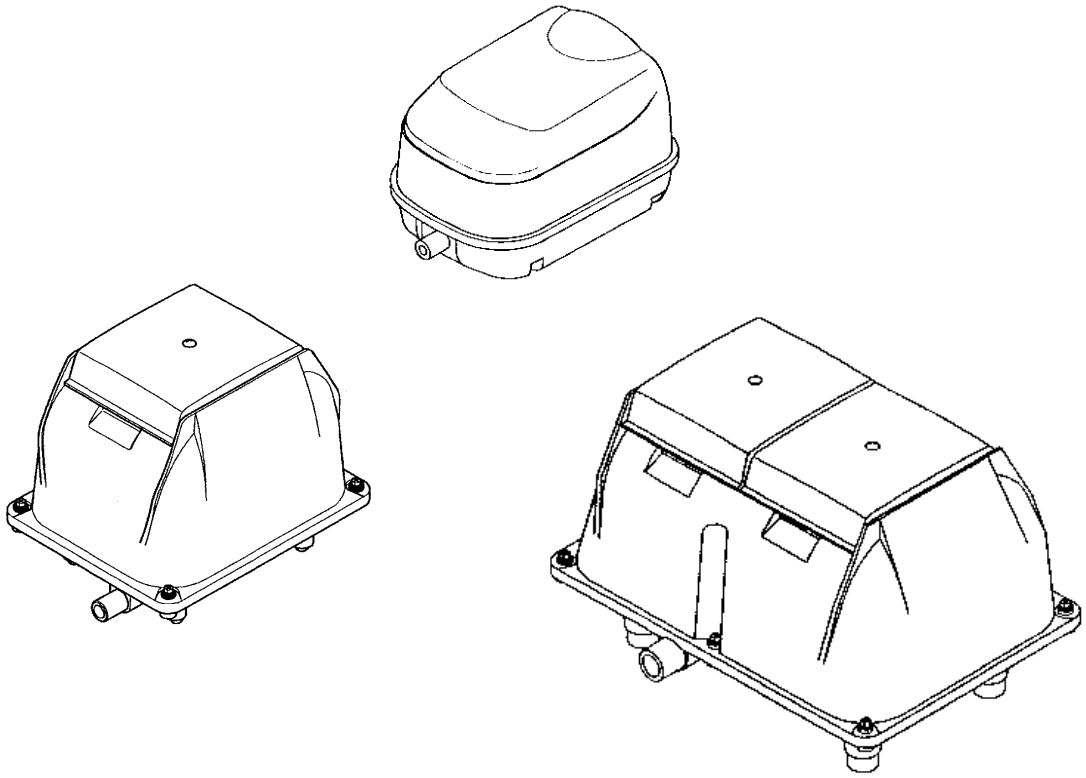
SECOH AIR PUMPS

(SHOWN AT EL SERIES)

MODEL: SLL-20, 30, 40 & 50

EL-60, 80-15, 80-17 & 100

EL-120W, 150 & 200



This manual is not meant to be included in the scope of delivery (for this we have the Instruction Manual), but is written especially to give advice to authorised service facility.

Table of contents

1. Prior to maintenance and service

- Prior to maintenance and service, please read this manual carefully.
- Follow the safety instructions!
- Servicing and maintenance as described in this manual should be carried out by an authorised service facility.

⚠ DANGER

- **Always disconnect power supply before servicing. Failure to do so could result in electrical shock, personal injury or death.**
- **Do not touch live parts. Touching live parts will result in electric shock.**

2. Maintenance

❖ Cleaning the air filter

The air filter should be cleaned every 3 to 4 months (according air quality) to insure correct operation.

❖ Occasional checks

- Is air blowing out properly?
- Is the air pump making abnormal noise or vibrations?
- Is the temperature of the air pump abnormally high?
- Is the power cord or plug damaged or discoloured?

➔ If any irregularity is found, read DIAGNOSIS OF FAILURES.

3. Filter element cleaning or replacement

a) Undo the truss head screw of the filter cover.

b) Remove the filter cover, by firmly pulling it off.

c) Remove the filter element and brush off any dust particles by hand.

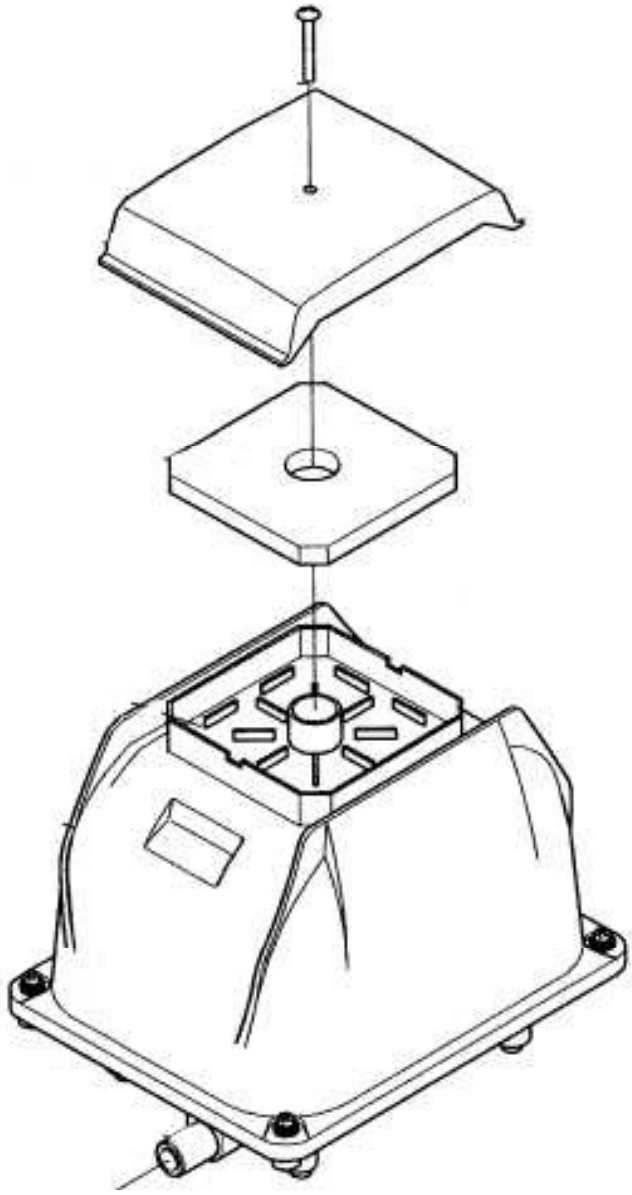
   If heavily clogged with dust, wash in a neutral detergent followed by a thorough rinsing in water. Allow to dry in the shade.

   Note: Do not use benzene or thinner to clean filter element as it can be damaged!

d) After cleaning reassemble the filter element back in place.

   Make sure to put the harder side of the filter facing downwards. Press in the filter cover.

e) Secure the filter cover by the truss head screw.



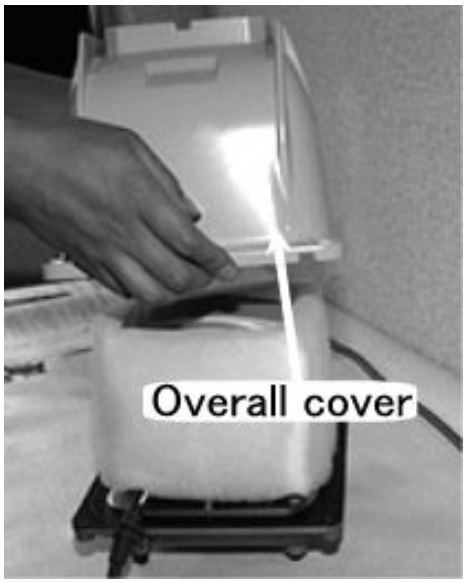
4. Valve box and diaphragm replacement

a) Undo the 4 corner bolts of the overall cover.

b) Remove the overall cover. If it is hard to remove, insert a screwdriver in the slot provided.

c) Pull out the bushing.

d) Remove the shock absorber

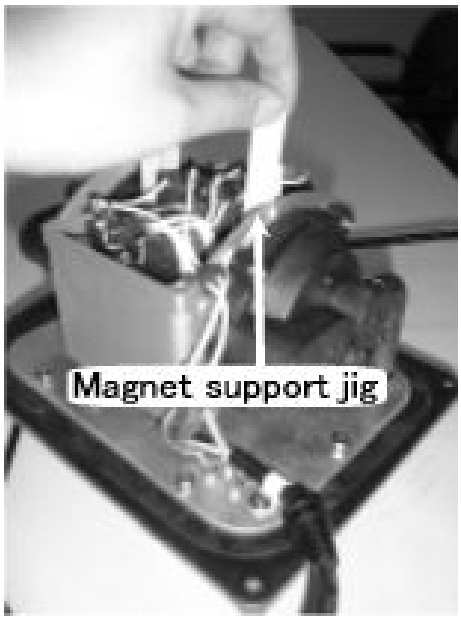


e) Undo the 4 screws of the holder cover.

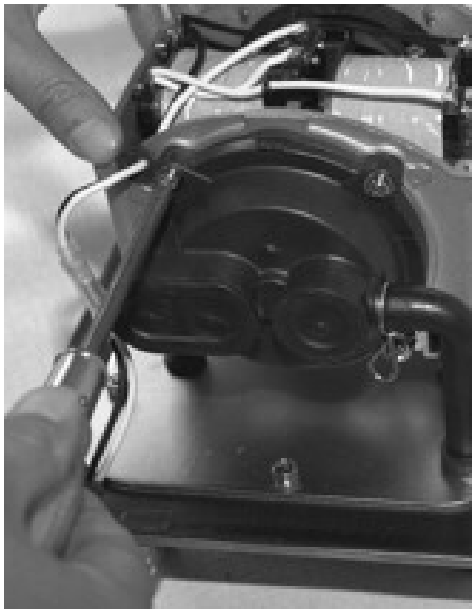
Note: It is easier to change one diaphragm at a time.

f) Insert the magnet support jig in the 4 corners, between the magnet and the core.

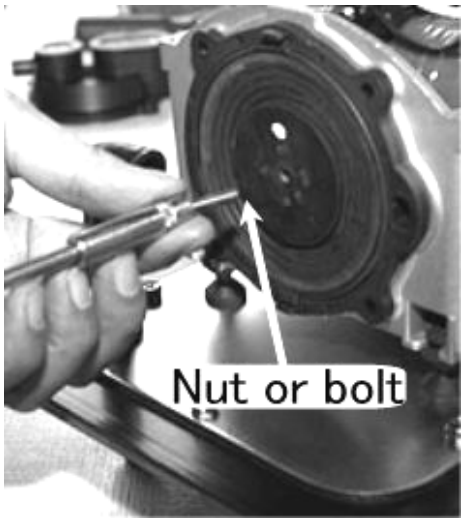
Note: The magnet support jig (carton strips) is included in the service repair kit.



g) Undo the 4 screws of the valve box.



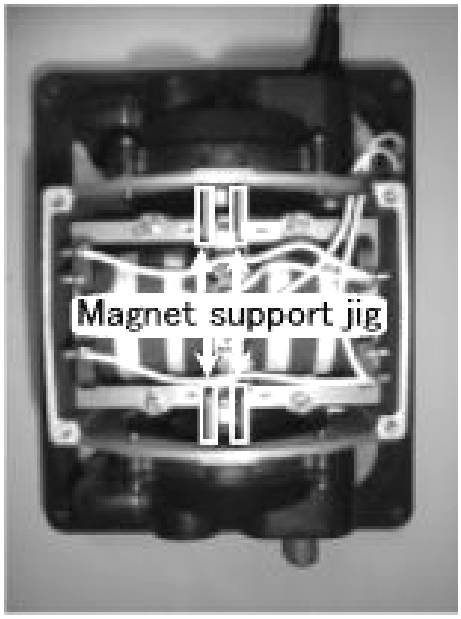
h) Slide down the hose clamp, pull off the connecting pipe and remove the valve box.



i) Undo the nut or bolt and remove the diaphragm (Nut: SLL series & EL-60, 80-15 & 120W. Bolt: EL-80-17, 100, 150 & 200).

j) Set the new diaphragm and fix it by the nut or bolt (see torque table).

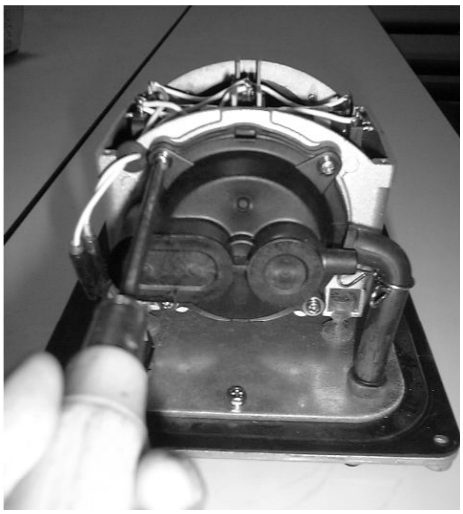
Note: Change the diaphragm always on both sites!



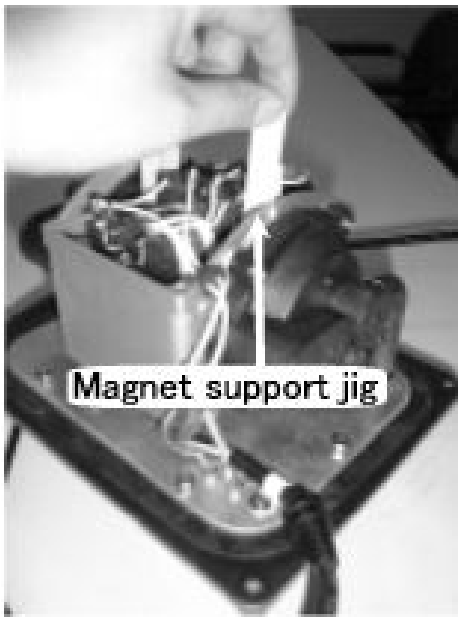
k) Insert the magnet support jig in the 4 corners, between the magnet and the core.

Note: Make sure that the magnet is in the centre of the solenoids.

l) Install the new valve box and secure into position using the 4 corner screws.



m) Replace opposite diaphragm following the above procedure.

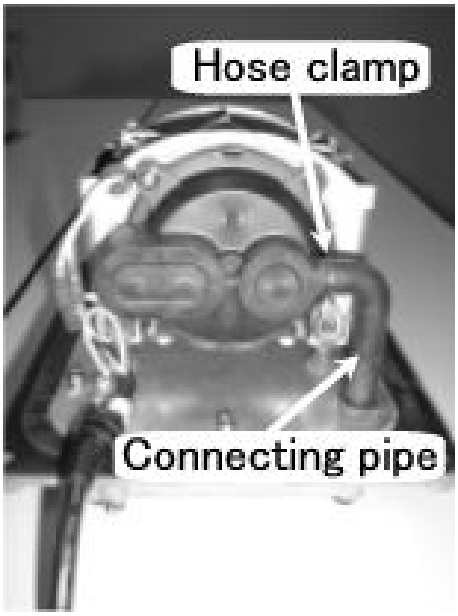


n) Pull out
the magnet support jig.

o) Check the magnet is in a central position.

Note: The tolerance of the centring of the magnet is within +/- 0.5 mm (see dimension “d” in sketch “Magnet Centring Criterions”).

If necessary, adjust it by either changing diaphragm from the left to the right, turning the permanent-magnet or turning the diaphragm for 180° in the frame.



p) Push on the connecting pipe and refit the hose clamp.

q) Reset the auto stopper, if necessary (see also chapter 5).

r) Connect power cord to confirm proper operation.

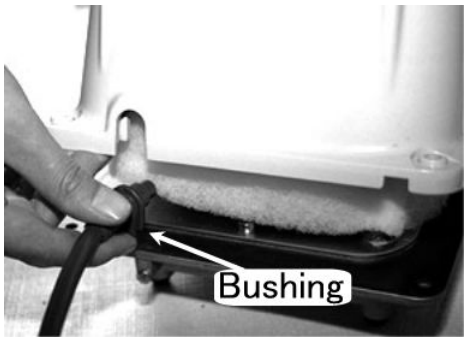
Danger: Do not touch live parts. Touching live parts will result in electric shock!

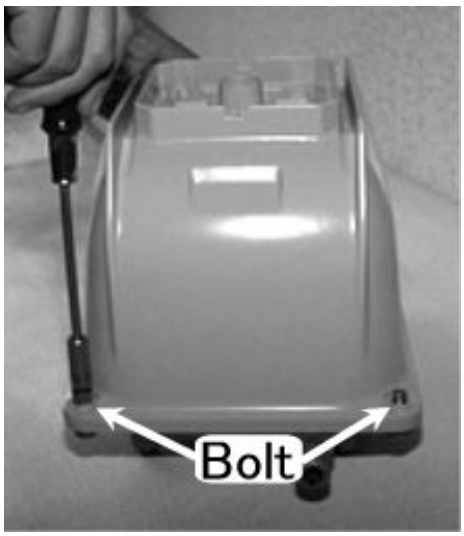
s) Fasten the holder cover with the screws.

t) Put the shock absorber back into place.

u) Insert the power cord bushing into the location notch.

Note: It locates into the inner slot!





v) Fasten the overall cover by using the nuts and bolts.

w) Mount the air filter following the procedure as under “filter element cleaning”.

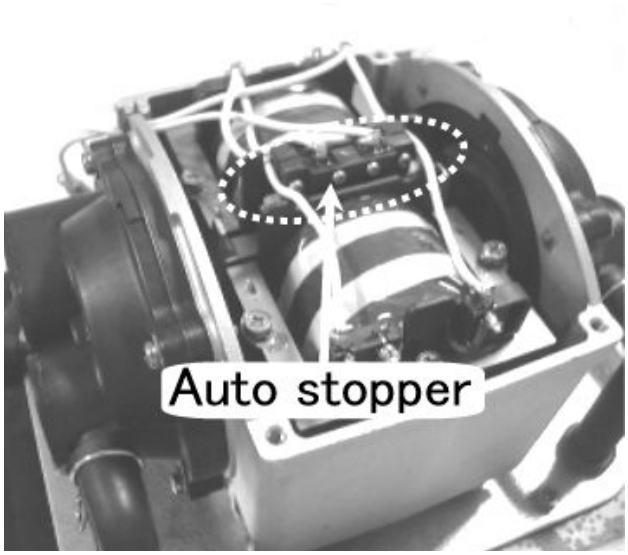
x) Confirm proper operation.

5. Reset auto stopper (protective switch)

Function of auto stopper

A running Pump with a broken diaphragm may cause a major break down and excessive repair cost. To prevent this from occurring, EL series pumps are equipped with a protective switch.

If the diaphragm or valve is broken, the magnet reciprocates with abnormal amplitude and the projection of the magnet hits the slider of the auto stopper. The contact is interrupted and power is off.



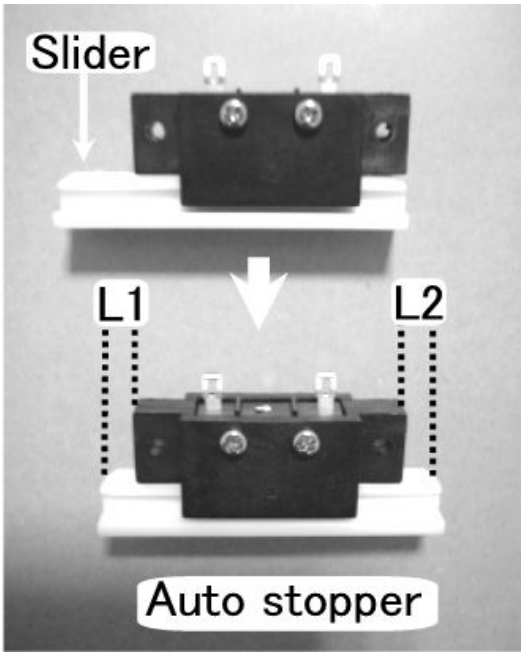
Reset of auto stopper

a) Follow the procedure of chapter 4 from a) to e)

b) Before reset the auto stopper, check the reason for its activation (such as broken diaphragm or valves). After remove of the cause reset the auto stopper..

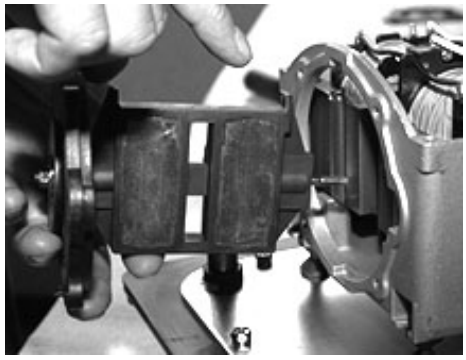
c) Set the slider at the position L1 = L2.

d) Follow the procedure of chapter 4 from r) to w).

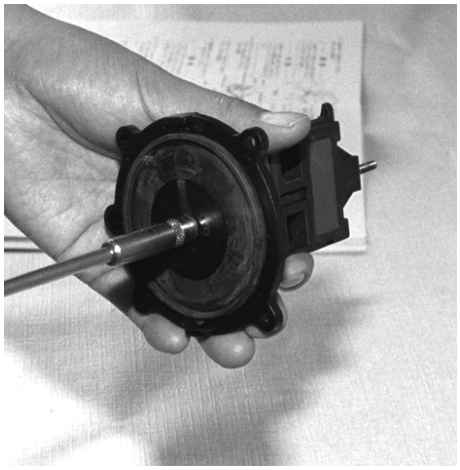


6. Magnet replacement

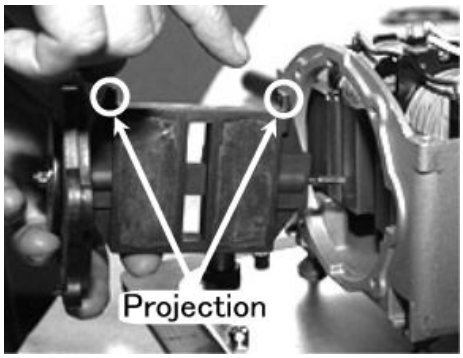
a) Follow the procedure of chapter 4 from a) to i).



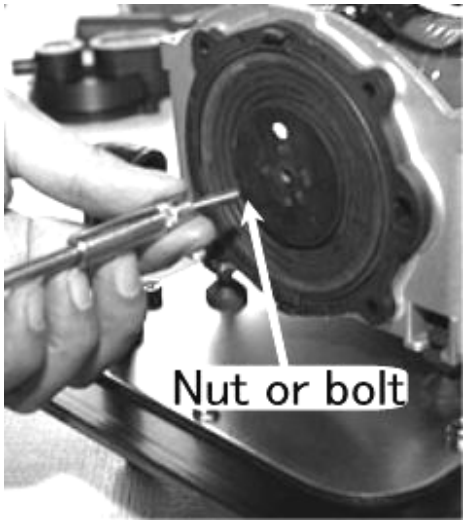
b) Remove diaphragm and pull out opposite diaphragm and magnet from other side.



c) Assemble new magnet and diaphragm with nut or bolt.



d) Insert the diaphragm and the magnet between the solenoids. The projection should be upward.



e) Install replacement diaphragm to opposite side.

f) Follow the procedure of chapter 4 from k) to w).

7. Diagnosis of Failures

Problem	Cause	Action
Pump does not work	Power plug is disconnected	Plug in and check if electricity is available
	Cord is broken (Internal wiring damaged)	Check electrical continuity with circuit tester
	Auto stopper activated	Open cover to check for damage on diaphragm or valve
Excessive noise	Valves or diaphragm are damaged	Open cover to check for damage or disconnection
	L-Tube is damaged or disconnected	Re-connect or replace L-Tube
	Pump is in touch with surrounding articles.	Re-position pump
Discharged air volume decreases	Air filter is clogged	Clean or replace air filter
	Air diffuser or pipe is clogged	Clean air diffuser and check piping
Abnormal temperature arises	Air filter is clogged	Clean or replace air filter
	Air diffuser or pipe is clogged	Un-block air diffuser or pipe
Pump sometimes operates and sometimes not. *	Air filter or diffuser is clogged	Clean or replace air filter or diffuser

*A decrease in airflow (caused by clogged air filter, diffuser or pipe) may lead to an extraordinary rise in operating temperature. This will activate a thermal protector and stop the pump. When the temperature reduces, the pump will automatically restart.

If in doubt about any service or maintenance procedures, please consult with your local distributor!

8. Technical Specification

Model		SLL-20	SLL-30	SLL-40	SLL-50
Voltage	V	As shown in the name plate			
Frequency	Hz	Applied to 50			
Oper. Press.	bar	0.12			0.13
Open Flow	L/min	33	39	50	56
Max Power	W	As shown in the name plate			
Outlet dia.	mm	OD 19 mm			
Weight	kg	approx. 4.5			
Standard accessories		L-Joint hose (with hose band)			

Model		EL-60	EL-80-15	EL-80-17	EL-100
Voltage	V	As shown in the name plate			
Frequency	Hz	Applied to 50			
Oper. Press.	bar	0.15	0.15	0.17	0.17
Open Flow	L/min	60	77	81	100
Max Power	W	As shown in the name plate			
Outlet dia.	mm	OD 19 mm			
Weight	kg	approx. 8.5			
Standard accessories		L-Joint hose (with hose band)			

Model		EL-120W	EL-150	EL-200
Voltage	V	As shown in the name plate		
Frequency	Hz	Applied to 50		
Oper. Press.	bar	0.20		
Open Flow	L/min	125	165	202
Max Power	W	As shown in the name plate		
Outlet dia.	mm	OD 27 mm		
Weight	kg	approx. 16		
Standard accessories		L-Joint hose (with hose band)		

- The air capacity in the specifications shown are typical values in service at operation pressure and so these are not guaranteed values.
- The air pump with the nameplate indicating EL-80 is identical with EL-80-17 shown in the list.
- All models also run with a frequency of 60 Hz, however with varying performance.

9. Test Data

a) Solenoid resistance table

Voltage:	230V, 50Hz
Tolerance:	+/- 10%
SLL-20 & 30 models:	Solenoids are in series connection
Other models:	Solenoids are in parallel connection

	Total R Ω	Single R Ω
SLL-20	220.0	110.0
SLL-30	162.0	81.0
SLL-40	86.5	173.0
SLL-50	60.8	121.7
EL-60	36.7	73.4
EL-80-15	21.9	43.7
EL-80-17	33.1	66.2
EL-100	20.0	40.0
EL-120W	16.2	64.7
EL-150	16.6	66.2
EL-200	10.0	40.0

b) Power consumption

The power consumption is at highest at open flow and at lowest at zero flow. To measure the power consumption of AC machines, you have to take care to measure the effective-power and not the apparent power! With a multimeter you usually measure the apparent power, which is rather higher than the effective power!

Formula for effective power: $P = U \times I \times \cos\varphi$ (only for two-phase-motors)

Formula of apparent power: $S = U \times I$

Legend:			
	P	=	Effective power in Watt (W)
	S	=	Apparent power in volt-amperes (VA)
	Q	=	Reactive power (VAR)
	U	=	Tension in Volt (V)
	I	=	Strengths of current in Ampere (A)
	Cosφ	=	Degree of effectiveness (Cosφ – value is usually noted from the Manufacturer on the label)

10. Spares Kits

Only use genuine Secoh replacement parts. Non-standard parts will have a detrimental effect on overall pump life and performance.

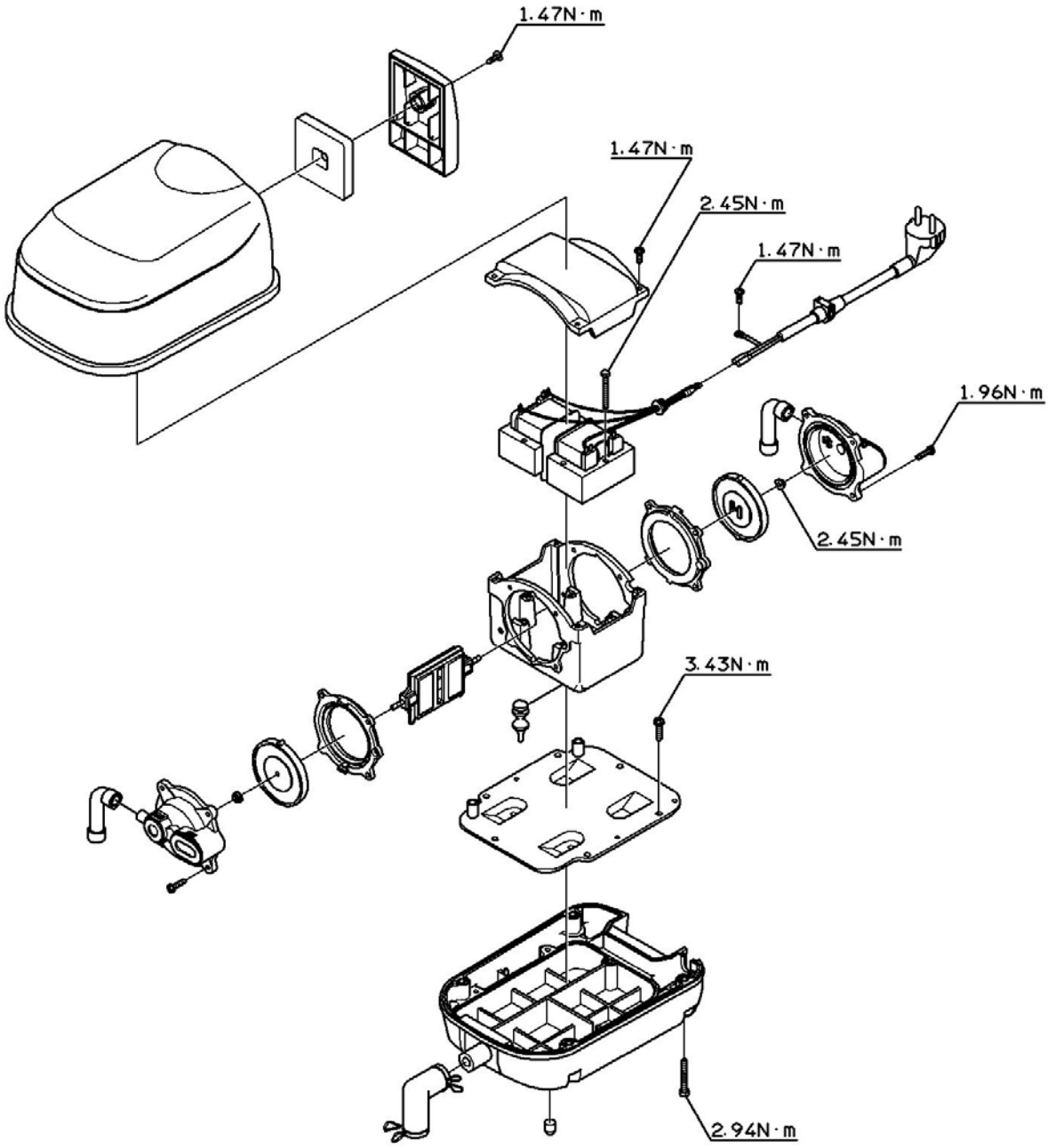
In order to ensure long service and operation, it is recommended diaphragms and valve boxes are replaced once a year.

SLL SERIES								
Kit Name	**Part No.** Code	Contents		Pos No	Required kit Qty			
		Parts included	Qty		**SLL20**	**SLL30**	**SLL40**	**SLL50**
Diaphragm repair kit	**K-SLL-D** EM-0359025	Diaphragm	2	10	1	1	1	1
		Diaphragm holder	2	9				
		Nut	2	24				
		Valve box & valve	2	11				
		Filter element	1	3				
		Filter cover packing	1	2				
		Tank base packing	1	17				
Magnet	**K-SLL-M** EM-0351008	Magnet	1	8	1	1	1	1
		Nut	2	24				
Filter element	**FILTER-SLL**	Filter element	1		1	1	1	1

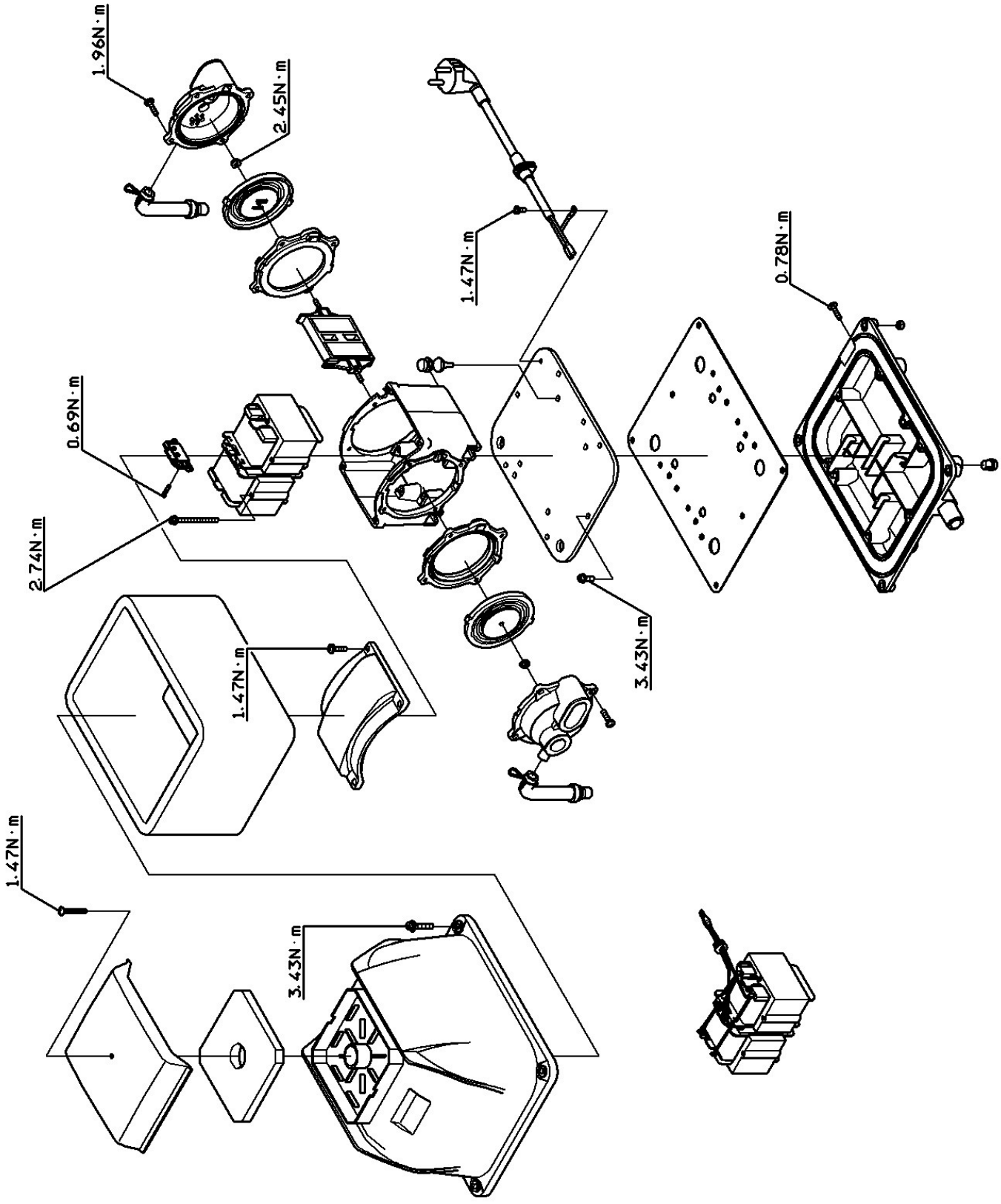
EL SERIES								
Kit name	**Part No.** Code	Contents		Pos No	Required kit Qty			
		Parts included	Qty		**EL60 EL80-15**	**EL80-17 EL100**	**EL120W**	**EL150 EL200**
Diaphragm repair kit	**K-EL-D** EM-0377007	Diaphragm	2	11	1	1	2	2
		Diaphragm holder	2	10				
		Nut	2	23				
		Valve box & valve	2	12				
		Filter element	1	2				
MAGNET	**K-EL60,80-15-M** EM-0374008	Magnet	1	9	1		2	
		Nut	2	23				
	K-EL80-17,100-M EM-0405000	Magnet	1	9		1		2
		Screw	2	23				
Filter element	**FILTER-EL**	Filter element	1		1	1	2	2
Auto stopper	**S-EL60,80-15,120W** EM-0433004	Auto stopper	1	6	1		2	
	S-EL80-17,150,200 EM-0434000	Auto stopper	1	6		1		2

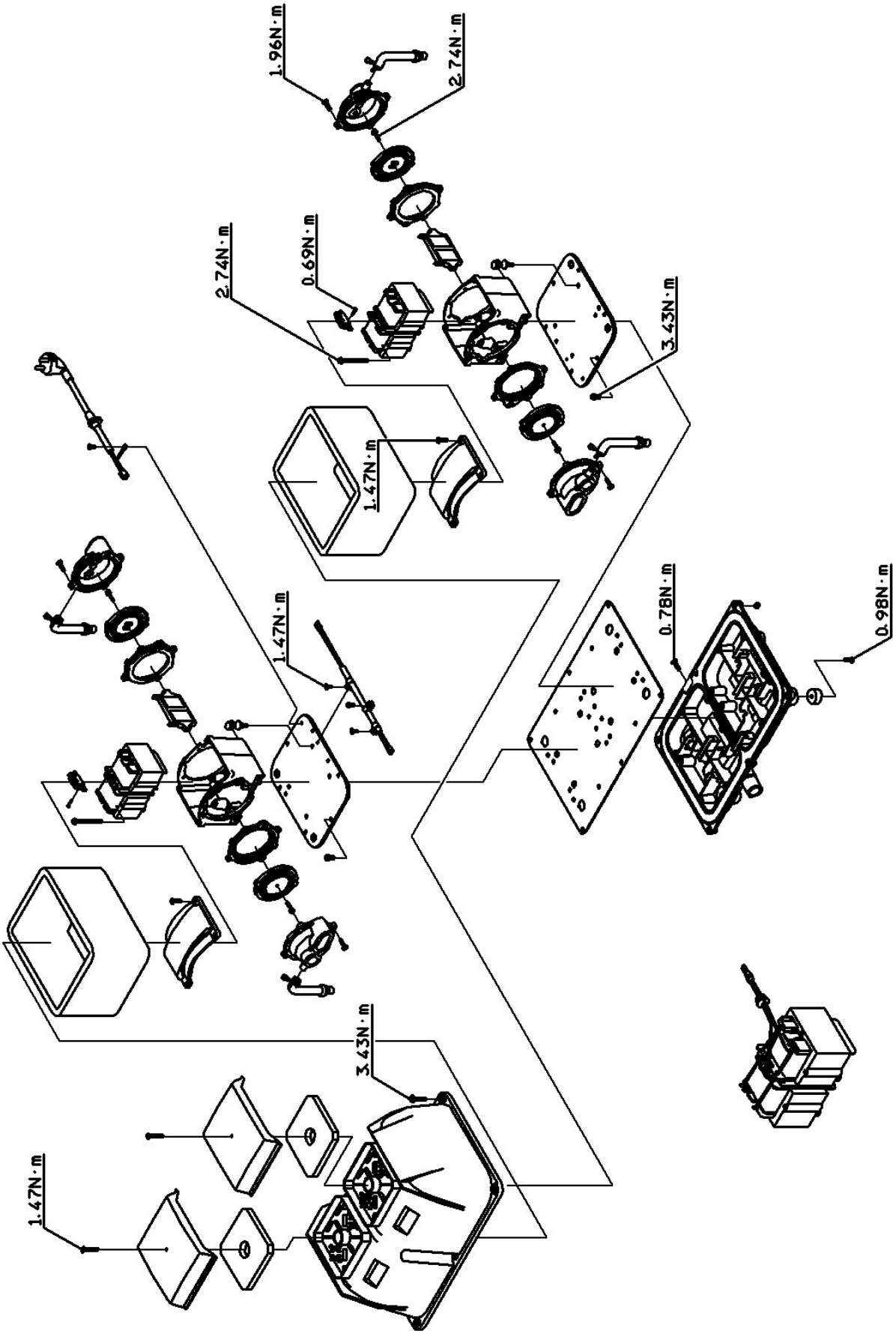
11. Torque table

SLL series



EL


1.96N · m
2.45N · m
1.47N · m
0.78N · m
0.69N · m
2.74N · m
3.43N · m
1.47N · m
1.47N · m
3.43N · m


1.96N·m
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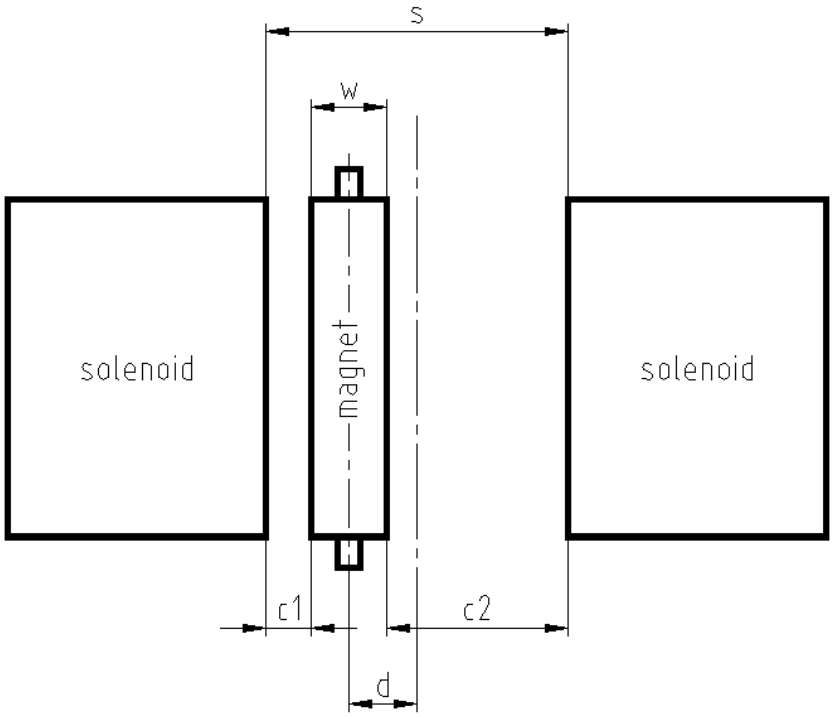
2.74N·m
0.69N·m
3.43N·m
1.47N·m
1.47N·m
0.78N·m
0.98N·m
3.43N·m
1.47N·m

12. Sketch “Magnet Centring Criterions”

The tolerance of the centring of the magnet is within +/- 0.5 mm (dimension “d”).

If necessary, adjust it by either changing diaphragm from the left to the right, turning the permanent-magnet or turning the diaphragm for 180° in the frame.



Warranty Enquiry Form Int.-No.

This form has to be used with each warranty enquiry!

Customer Details

Company ..... Phone .....
Name ..... Fax .....
Address ..... e-mail .....
Code/Place .....

Blower details

Model ..... Serial-No. .....
Date of production ..... Date of installation .....
Order- or Invoice-No. .....

Operating Conditions

Application .....
Pipe (diameter, lengths etc.) .....
Back Pressure .....
Duty cycle (continuous, intermittent, min. on/off etc.) .....
.....
.....
Ambient (temperature, quality of air, ventilation etc.) .....
.....
.....

Complaints and comments

.....
.....

Date ..... Signature .....

Customer Service Office

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