



Classic Line

Direct acting solenoids
Monostable direct acting solenoids
Accessories



WE MAGNETISE THE WORLD



Kendrion N.V. is one of the leading manufacturers of solenoids and electro-magnetic components worldwide.

Divided into the Industrial and Automotive division Kendrion guarantees a solution-oriented partnership with our customers. The company excels in innovative capability and maximum productivity.

Over the years Kendrion has integrated the brands Binder, Magnet AG, Neue Hahn Magnet, Thoma Magnettechnik, Linnig Antriebstechnik, Tri Tech LLC, Magneta and FAS Controls and Kuhnke.

Our business unit Industrial Magnetic Systems belongs to the division Industrial and develops, manufactures and distributes linear-, holding-, locking-, spreading-, control-, rotary- and vibrating solenoids as well as solenoid valves for industrial applications worldwide.

The strengths of Kendrion lies in the area of standard applications and in the area of developing customer-specific solutions.

With our technological know-how we ensure that your application will run smoothly.

All products are tested and developed according to DIN VDE 0580/ 07.2000. Kendrion Magnettechnik GmbH is a company certified according to ISO 9001:2008.

The main locations are in Donaueschingen (D) and Engelswies (D). Further locations are in Hausen am Albis (CH), Linz (A), Bradford (UK), Suzhou (CN), Mishawaka (USA) and Turin (I).

With our global distribution network we are available for our customers at any time and will be pleased to advise you.

Our products are used in almost all industrial areas, for example in the following industries:

- Machine building
- Safety engineering
- Transportation industry
- Medical engineering
- Power engineering
- Environmental technology
- Elevator industry
- Automation

Your industry is not listed? We are sure to have an optimum solution.

Wherever innovations and new approaches are required our staff will be happy to assist you.

Contact us. We're looking forward to assisting you!

Sales Hotline +49 (0) 771 8009 3770

Please find detailed performance data in our product catalogues, with the help of our experts or by our product finder on:

www.kendrion-ims.com





Product Line

Description

RoHS: Restriction of Hazardous Substances.

Classic Line

Linear solenoids of the Kendrion Classic Line are universal and cost-effective actuating solenoids ideally suited for use in precision engineering and industrial applications. These solenoids are used in the transportation industry, automation engineering and materials handling. Particular advantages are the individual mounting options, the maintenance-free armature bearing and the compact design. The mode of operation of the solenoid is based on the force exerted on ferromagnetic bodies in the magnetic field. Electromagnets transform electric energy into mechanical kinetic energy.

Basically, the stroke movement takes place from the stroke starting position to the stroke stop position (active direction of movement), while the armature reset is accomplished by external forces, e.g. by spring, weight or magnetic forces (passive direction of movement).

The solenoids can be installed in any position, but the force transfer should be in axial direction only. The power indicated is reached at 90% of the rated voltage and in warmed-up condition. The values for the duty cycles are reference values and apply for rated voltage, warmed-up condition and load with 70% of the magnetic force of the device.

All products are manufactured and tested according DIN VDE 0580/07.2000 and comply with RoHS.

Design subject to change.

The solenoids listed here include both standardized products and special models. Please contact us about minimum order quantities and delivery times. Different voltages are possible.



LCL012014A00 - LCL024031A00

Direct acting solenoids of the types LCL012014A00 to LCL024031A00 are open frame solenoids with armature and punched C-frame. For this armature guide a brass sleeve is used.

Parts at risk of corrosion are electrogalvanised acc. DIN 50979. The armature is chemically nickel-plated acc. ISO 4527.

A certain purchase quantity provided and for a small surcharge this series can be supplied with a specially coated armature in order to increase the life expectancy. The high-quality special coating with a highly wear-resistant sliding surface and particularly low friction coefficients allows for up to 5 mio. switching operations.

Model

Lead wires
 Standard rated voltage = 24 V DC
 Standard duty cycle = 100%

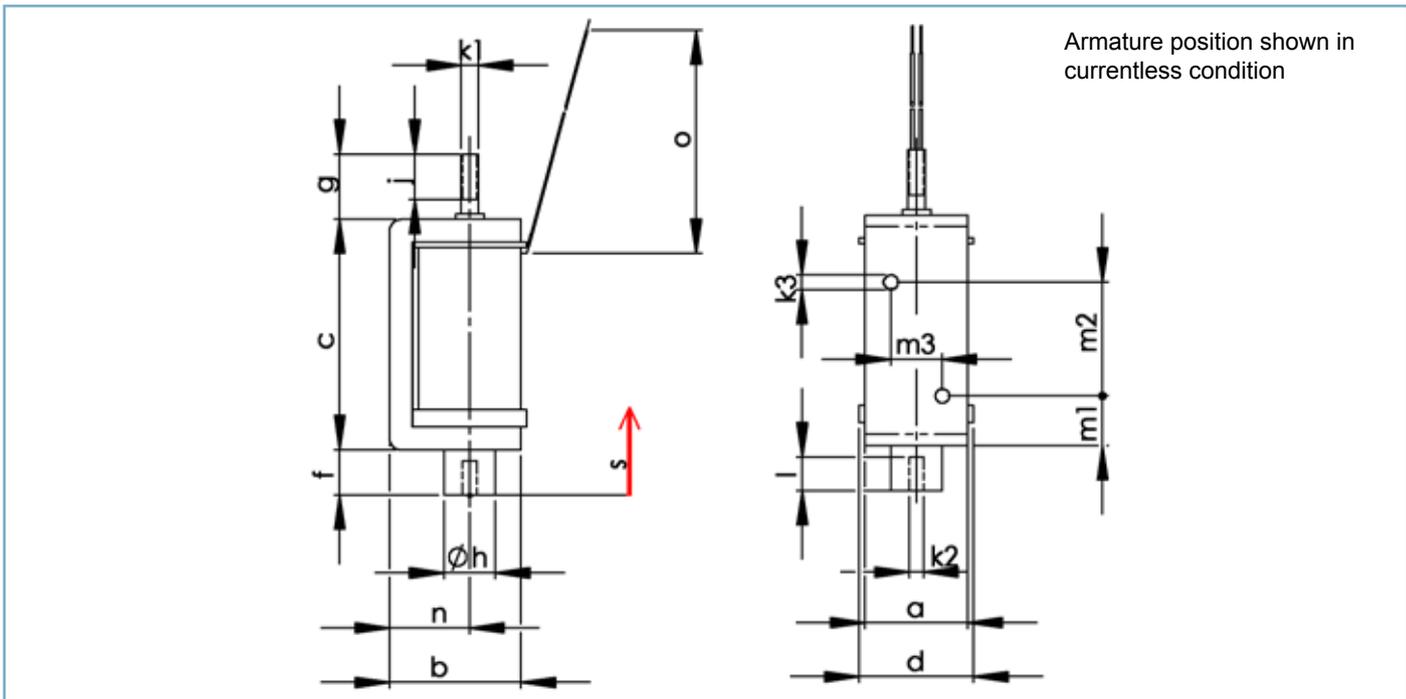
Installation Notes

Lateral mounting of the solenoid via thread

Accessories

- Return spring possible with some types
- Fork head

Cross Section



Dimensions in mm

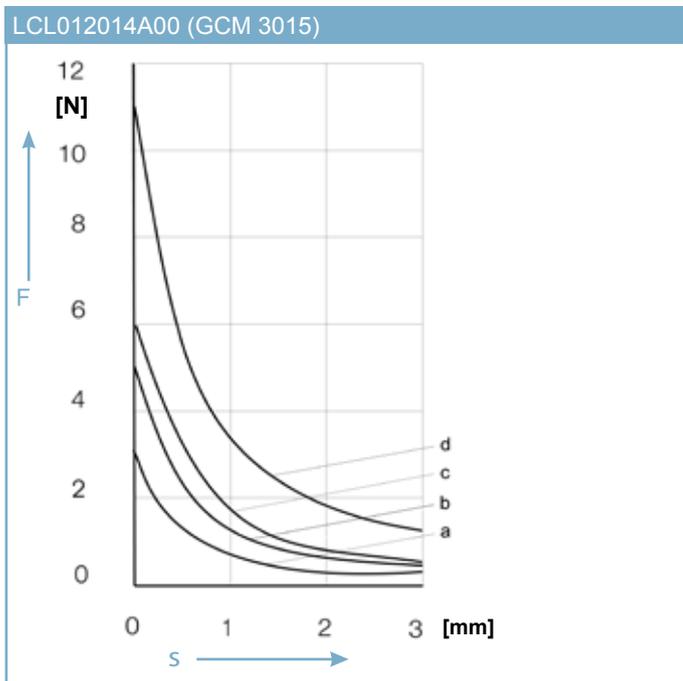
Designation	a	b	c	d	e	f	g	h	i	k1	k2	k3	m1	m2	m2	l	n	o
LCL012014A00	12	14	30	13	3	5	12,5	6	8	M2	M3	M3	6	18	6	6	8	130
LCL015018A00	15	18	25	16	3	8	10	7	7	M2	M3	M3	8	10	9	6	10,2	130
LCL018022A00	18	22	31,5	20	4	6	10	8	8,5	M3	M3	M3	5,5	20	8	6	12	130
LCL018024A00	18	24	40,5	20	6	8	9,5	9	8,5	M3	M3	M3	8,7	20	9	6	13,5	130
LCL024031A00	24	31	40	26	6	8	10	12	10	M3	M3	M4	7,5	25	14	6	16,5	130

Technical Data

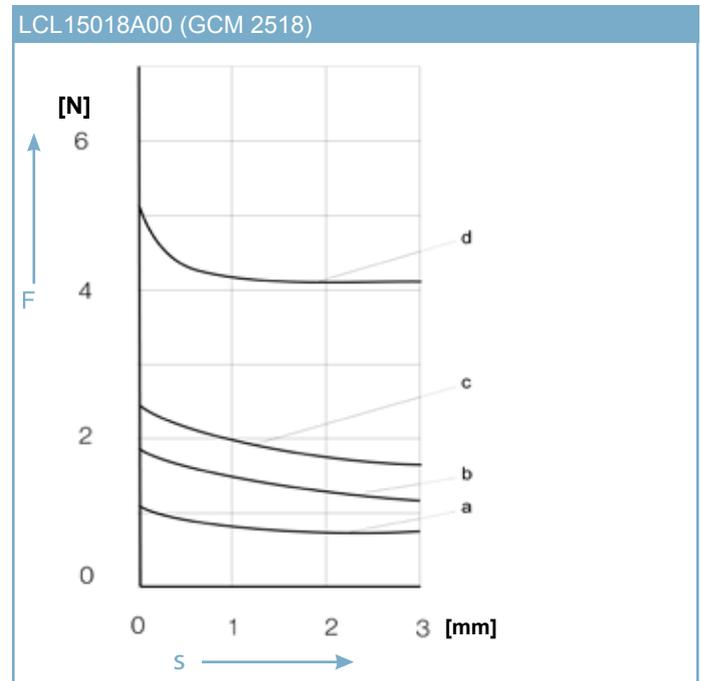
Designation	LCL012014A00				LCL015018A00				LCL018022A00			
Duty cycle [%]	100	40	25	5	100	40	25	5	100	40	25	5
Stroke [mm]	3				3				4			
Rated power [W]	4	7,6	11	35	3,8	7,5	10,5	34,5	6,7	13,2	19	63
Response time [ms]	23	21	20	17	34	31	31	29	45	41	40	38
Release time [ms]	20	19	16	15	31	30	30	30	40	39	37	36
Armature weight [kg]	0,006				0,005				0,01			
Solenoid weight [kg]	0,02				0,04				0,06			
Protection class [IP]	IP 00				IP 00				IP 00			
Insulation class	B				B				B			

Designation	LCL024024A00				LCL024031A00			
Duty cycle [%]	100	40	25	5	100	40	25	5
Stroke [mm]	6				6			
Rated power [W]	7,6	16	23,5	87	8,7	18	25,5	89
Response time [ms]	42	40	37	35	48	47	47	45
Release time [ms]	45	43	43	41	38	36	34	32
Armature weight [kg]	0,014				0,024			
Solenoid weight [kg]	0,08				0,15			
Protection class [IP]	IP 00				IP 00			
Insulation class	B				B			

Stroke Force Curves



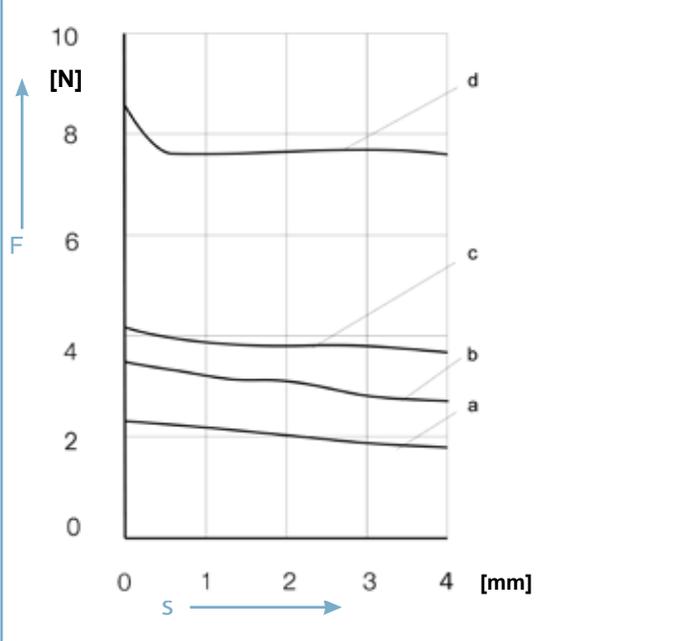
Duty cycle:
a = 100% b = 40% ;
c = 25% d = 5% ;
Values in brackets = old designation



Duty cycle:
a = 100% b = 40% ;
c = 25% d = 5% ;
Values in brackets = old designation

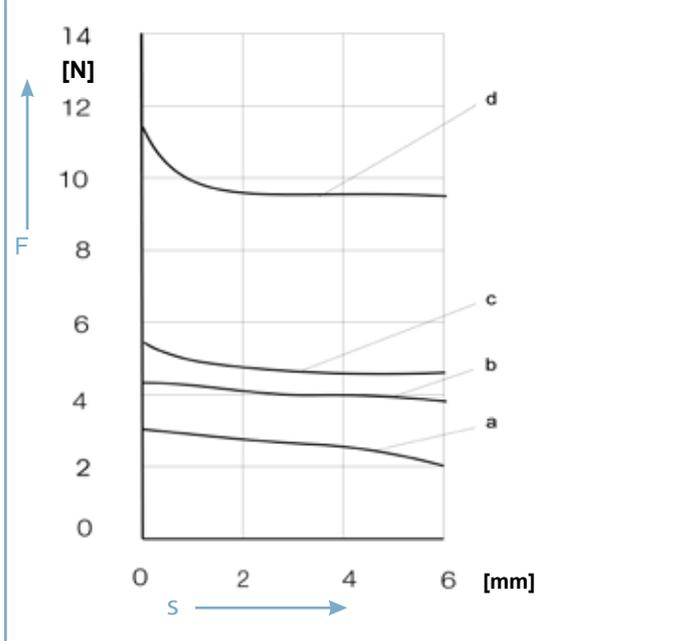
Stroke Force Curves

LCL018022A00 (GCM 3220)



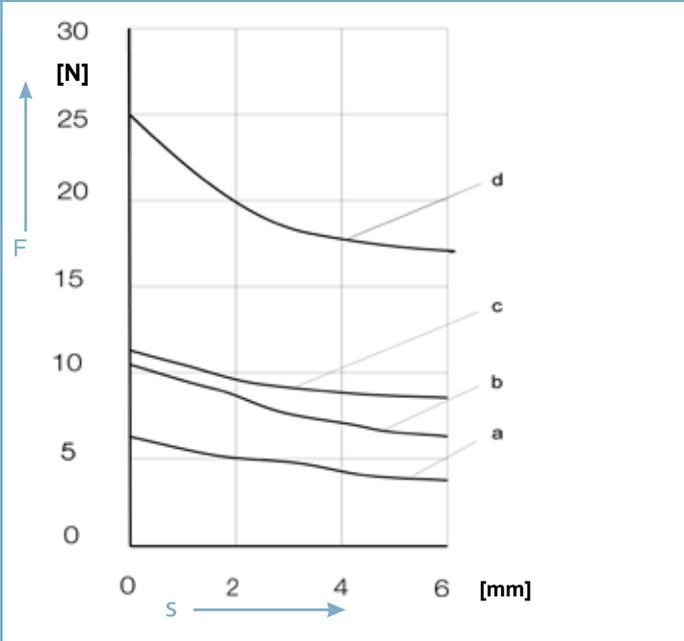
Duty cycle:
 a = 100% b = 40% ;
 c = 25% d = 5%
 Values in brackets = old designation

LCL018024A00 (GCM 4025)



Duty cycle:
 a = 100% b = 40% ;
 c = 25% d = 5%
 Values in brackets = old designation

LCL024031A00 (GCM 4030)



Duty cycle:
 a = 100% b = 40% ;
 c = 25% d = 5%
 Values in brackets = old designation



Model

Device - insulation class IP40
Lead wires – insulation class IP00
Connection by connector plug – insulation class IP65
Standard rated voltage = 24 V DC / 205 V DC
Standard duty cycle = 100% ED

LCL030035A00 - LCL070080A00

Direct acting solenoids of the LCL 030035A00 to LCL 070080A00 series meet high standards in terms of performance and life expectancy.

Compact dimensions and low power consumption, fast switching times and smooth operation characterise this series. The housing is made of precision steel tube. The armature is guided in highly wear-resistant maintenance-free precision bearings on both sides, resulting in consistent solenoid performance throughout the long service life.

The coil is encapsulated with plastics as standard.

Parts at risk of corrosion are electrogalvanized acc. EN 12329. The armature is galvanically coated acc. EN 12540.

Installation Notes

Lateral or face mounting of the solenoid via thread

Accessories

- plug-in connector acc. DIN EN 175301-803 (DIN43650)
- return spring
- fork head
- plug-in connector with overexcitation (rated power max. 48 W)
- energy saving by MPR-module possible

Technical Data

Designation	LCL030035A00											
Duty cycle [%]	100			40			25			5		
Stroke [mm]	5	10	15	5	10	15	5	10	15	5	10	15
Response time [ms]	61	68	75	53	59	65	41	45	50	24	27	30
Release time [ms]	28	32	35	24	27	30	20	23	25	16	18	20
Rated power [W]	10,5			18			26,5			100		
Armature weight [kg]	0,055											
Solenoid weight [kg]	0,25											
Insulation class	B											

Designation	LCL040050A00															
Duty cycle [%]	100				40				25				5			
Stroke [mm]	5	10	15	20	5	10	15	20	5	10	15	20	5	10	15	20
Response time [ms]	98	109	122	135	66	73	81	90	51	57	63	70	33	36	41	45
Release time [ms]	33	36	41	45	29	32	36	40	24	27	30	33	18	20	23	25
Rated power [W]	18				38				57				234			
Armature weight [kg]	0,125															
Solenoid weight [kg]	0,66															
Insulation class	B															

Designation	LCL048060A00															
Duty cycle [%]	100				40				25				5			
Stroke [mm]	5	10	15	25	5	10	15	25	5	10	15	25	5	10	15	25
Response time [ms]	144	160	178	220	92	102	113	140	62	69	77	95	33	37	41	50
Release time [ms]	36	40	45	55	33	36	40	50	26	29	32	40	20	22	24	30
Rated power [W]	22				45				75				308			
Armature weight [kg]	0,23															
Solenoid weight [kg]	1,16															
Insulation class	B															

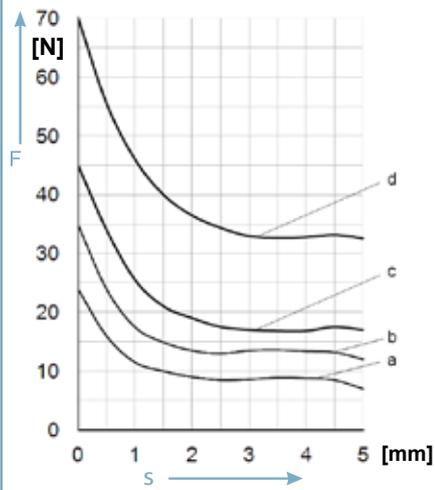
Designation	LCL060070A00															
Duty cycle [%]	100				40				25				5			
Stroke [mm]	5	10	15	25	5	10	15	25	5	10	15	25	5	10	15	25
Response time [ms]	230	255	284	350	138	153	170	210	86	95	105	130	36	40	45	55
Release time [ms]	44	49	54	67	41	45	50	62	31	35	39	48	24	26	29	36
Rated power [W]	28				65				98				470			
Armature weight [kg]	0,41															
Solenoid weight [kg]	2,04															
Insulation class	B															

Designation	LCL070080A00																			
Duty cycle [%]	100					40					25					5				
Stroke [mm]	5	10	15	20	30	5	10	15	20	30	5	10	15	20	30	5	10	15	20	30
Response time [ms]	266	295	328	365	450	186	207	230	255	315	103	115	128	142	175	35	39	44	49	60
Release time [ms]	48	53	59	66	81	47	52	58	65	80	34	38	42	47	58	25	28	31	35	43
Rated power [W]	39					95					150					680				
Armature weight [kg]	0,63																			
Solenoid weight [kg]	3,25																			
Insulation class	B																			

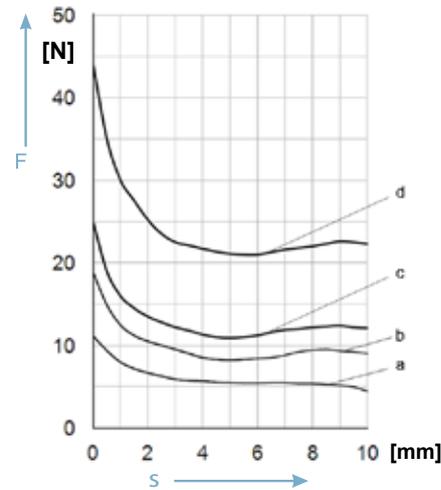
Stroke Force Curves

LCL030035A00 (43 11...03D00)

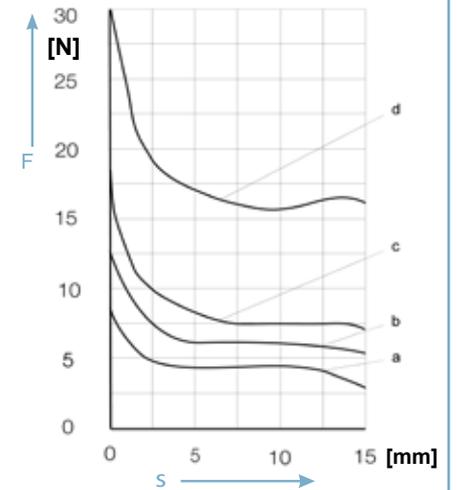
Stroke: 5 mm



Stroke: 10 mm



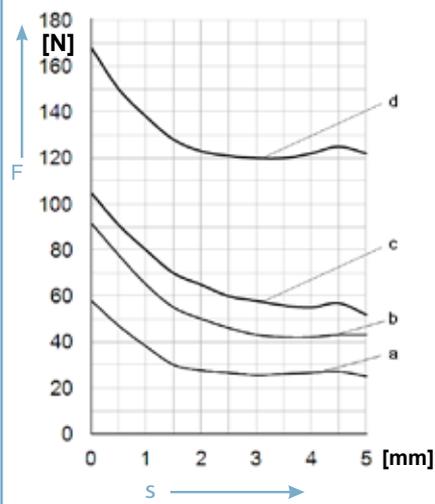
Stroke: 15 mm



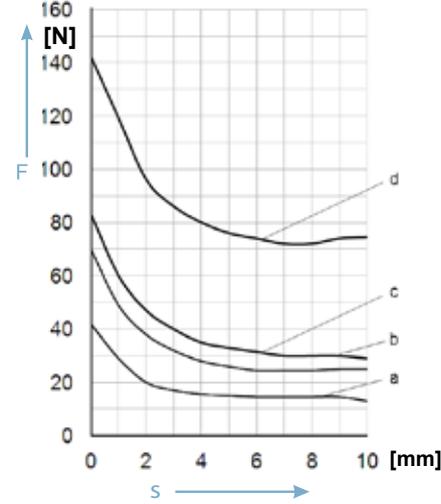
Duty cycle: a = 100%, b = 40%, c = 25%, d = 5%, Values in brackets = old designation

LCL040050A00 (43 11...04E00)

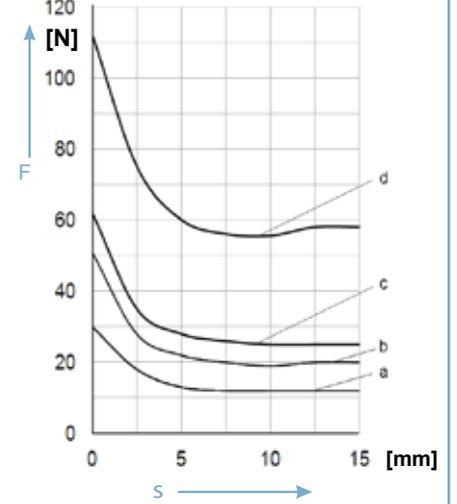
Stroke: 5 mm



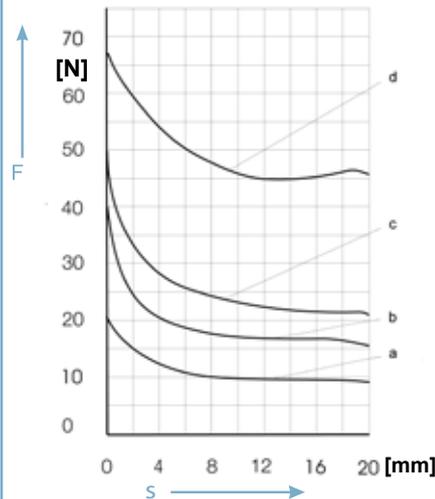
Stroke: 10 mm



Stroke: 15 mm



Stroke: 20 mm

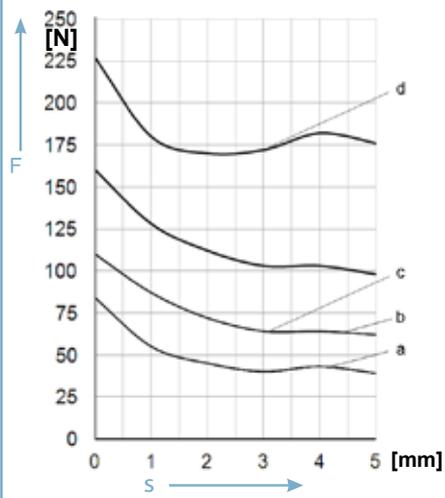


Duty cycle: a = 100%, b = 40%, c = 25%, d = 5%, Values in brackets = old designation

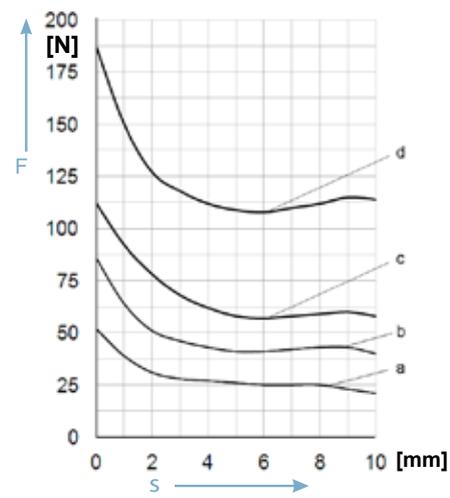
Stroke Force Curves

LCL048060A00 (43 11...05D00)

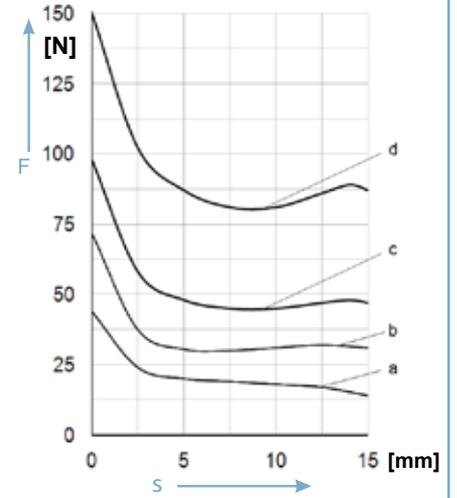
Stroke: 5 mm



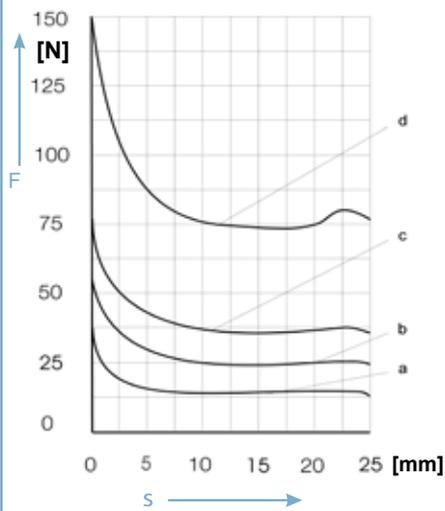
Stroke: 10 mm



Stroke: 15 mm



Stroke: 25 mm

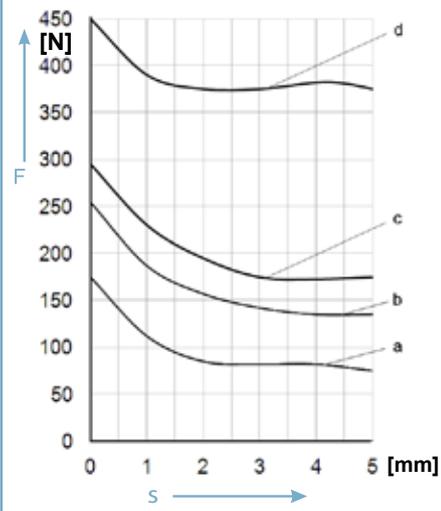


Duty cycle: a = 100%, b = 40%, c = 25%, d = 5%, Values in brackets = old designation

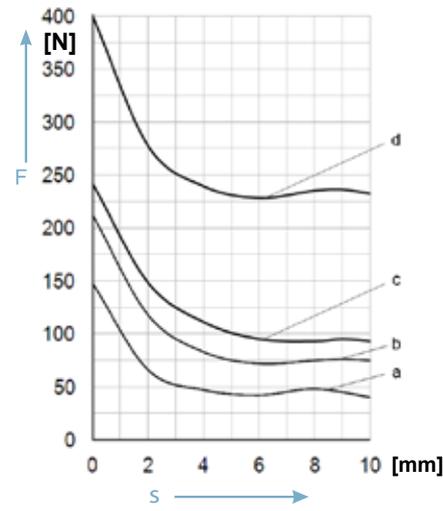
Stroke Force Curves

LCL060070A00 (43 11...06D00)

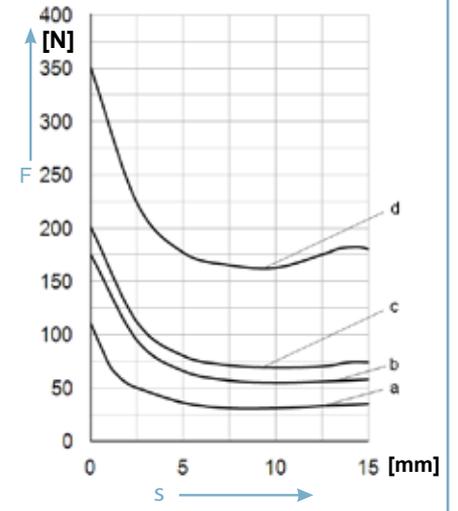
Stroke: 5 mm



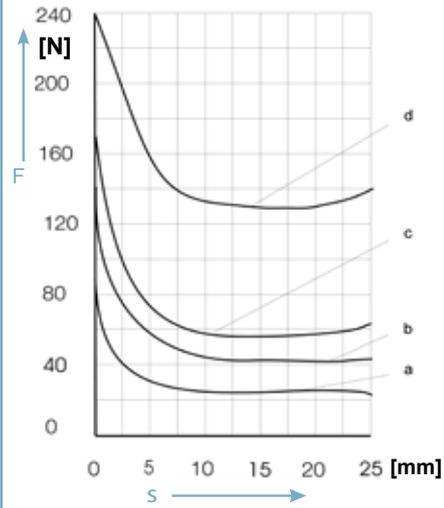
Stroke: 10 mm



Stroke: 15 mm



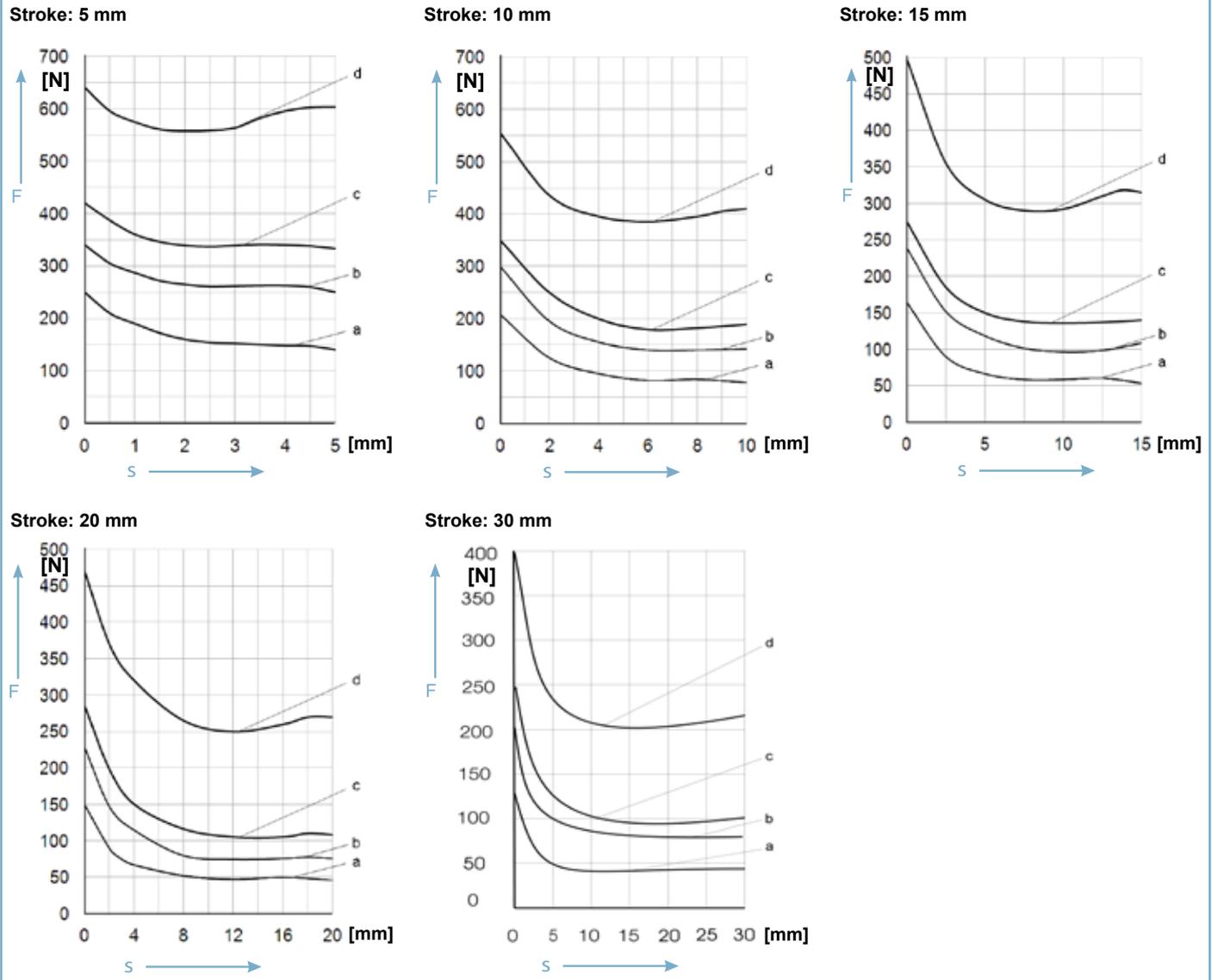
Stroke: 25 mm



Duty cycle: a = 100%, b = 40%, c = 25%, d = 5%, Values in brackets = old designation

Stroke Force Curves

LCL070080A00 (43 11...07D00)



Duty cycle: a = 100%, b = 40%, c = 25%, d = 5%, Values in brackets = old designation



Model

Device - insulation class IP54
 Connection by connector plug – insulation class IP65
 Standard rated voltage = 24 V DC / 205 V DC
 Standard duty cycle = 100% ED

LCL030035 - LCL070080

Direct acting solenoids of the type series LCL030035 to LCL070080 acc. protection class IP54/65 meet high standards in terms of performance and life expectancy. Compact dimensions and low power consumption, fast switching times and smooth operation characterise this type series.

The housing is made of precision steel tube. The armature is guided in highly wear-resistant maintenance-free precision bearings on both sides.

With steady solenoid performance a long service life is achieved. The coil is encapsulated in plastics as standard.

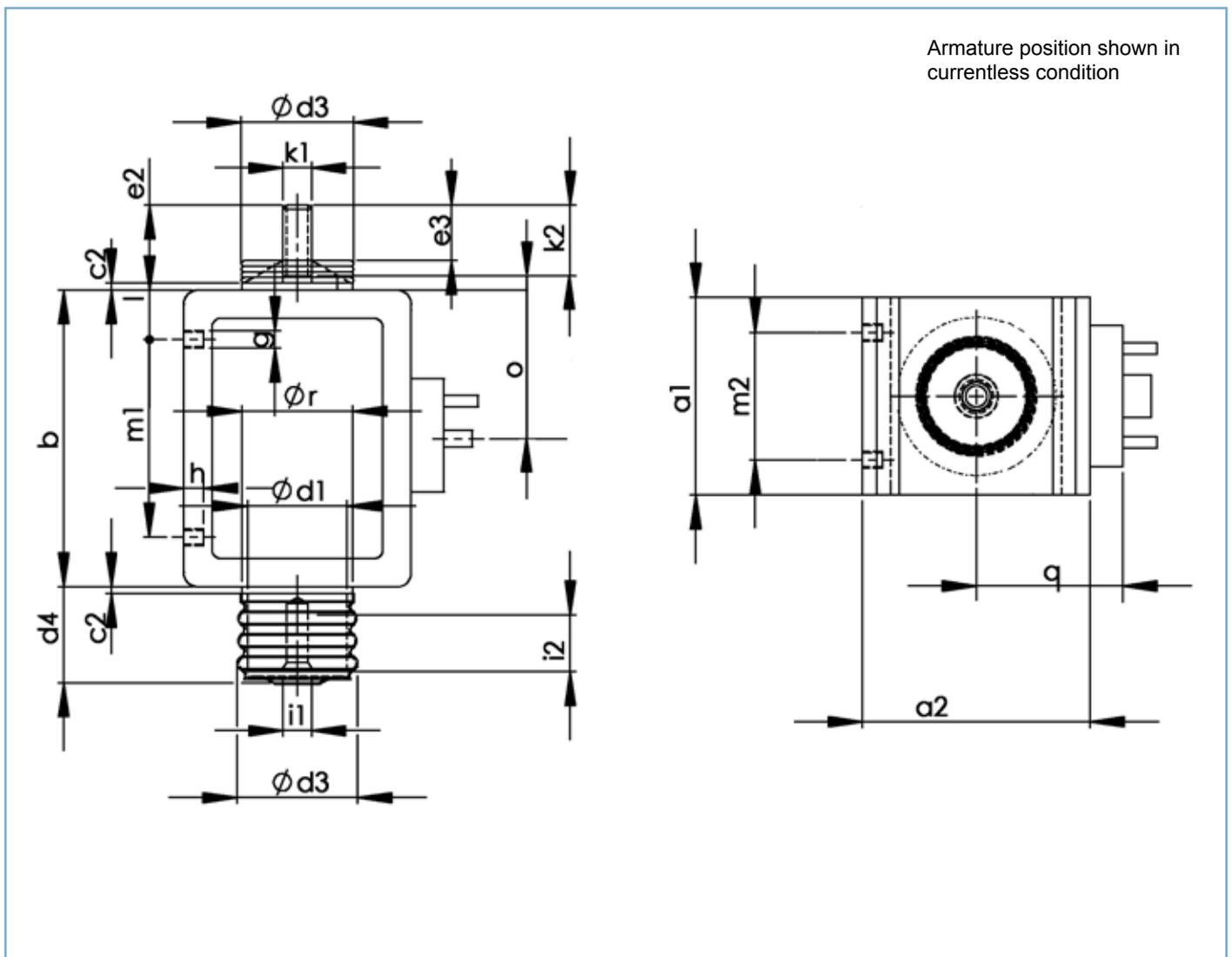
Installation Notes

Lateral mounting of the solenoid via thread. Mounting on the face is not possible

Accessories

- fork head
- plug-in connector with bridge rectifier
- switching device with overexcitation (rated power max. 48 W)
- return spring can not be used
- energy saving by MPR-module possible

Cross Section



Dimensions in mm

Designation	s	a1	a2	b	c1	c2	d1	d2	d3	d4	e1	e2	e3	i1	i2	k1	k2	l	m1	m2	o	p	q	r
LCL030035A02	5	30	35	45	17	2,5	15	18	26,5	14	15	19	10	M4	8	M4	10	10	25	22	22,5	9	27	17
	10									19														
	15									24														
LCL040050A02	5	40	50	65	23	2,5	20	23	34	19	20	27	17	M6	14	M6	15	12,5	40	30	32,5	9	34,5	23
	10									24														
	15									29														
	20									34														
LCL048060A02	5	48	60	75	28	2,5	25	28	40	18	25	36	20	M8	15	M8	20	15	45	38	37,5	9	39,5	28
	10									23														
	15									28														
	25									38														
LCL060070A03	5	60	70	90	34	2,5	30	28	46	27	25	42	20	M8	15	M8	20	15	60	48	45	9	44,5	34
	10									32														
	15									37														
	25									47														
LCL070080A01	5	70	80	105	39	2,5	35	33	53	30	30	50	25	M10	22	M10	25	17,5	70	55	52,5	9	49,5	39
	10									35														
	15									40														
	20									45														
	30									55														

Technical Data

Designation	LCL030035A02											
Duty cycle [%]	100			40			25			5		
Stroke [mm]	5	10	15	5	10	15	5	10	15	5	10	15
Response time [ms]	61	68	75	53	59	65	41	45	50	24	27	30
Release time [ms]	28	32	35	24	27	30	20	23	25	16	18	20
Rated power [W]	10,5			18			26,5			100		
Armature weight [kg]	0,055											
Solenoid weight [kg]	0,25											
Insulation class	B											

Designation	LCL040050A02															
Duty cycle [%]	100				40				25				5			
Stroke [mm]	5	10	15	20	5	10	15	20	5	10	15	20	5	10	15	20
Response time [ms]	98	109	122	135	66	73	81	90	51	57	63	70	33	36	41	45
Release time [ms]	33	36	41	45	29	32	36	40	24	27	30	33	18	20	23	25
Rated power [W]	18				38				57				234			
Armature weight [kg]	0,125															
Solenoid weight [kg]	0,66															
Insulation class	B															

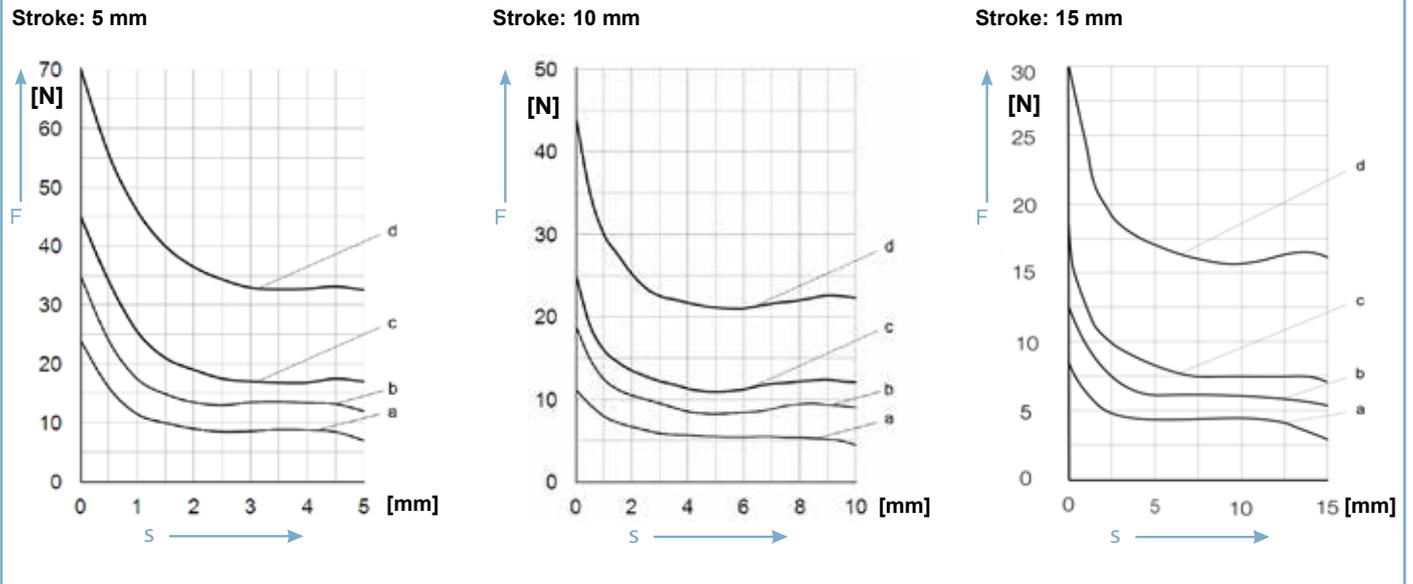
Designation	LCL048060A02															
Duty cycle [%]	100				40				25				5			
Stroke [mm]	5	10	15	20	5	10	15	20	5	10	15	20	5	10	15	20
Response time [ms]	144	160	178	220	92	102	113	140	62	69	77	95	33	37	41	50
Release time [ms]	36	40	45	55	33	36	40	50	26	29	32	40	20	22	24	30
Rated power [W]	22				45				75				308			
Armature weight [kg]	0,23															
Solenoid weight [kg]	1,16															
Insulation class	B															

Designation	LCL060070A03															
Duty cycle [%]	100				40				25				5			
Stroke [mm]	5	10	15	20	5	10	15	20	5	10	15	20	5	10	15	20
Response time [ms]	230	255	284	350	138	153	170	210	86	95	105	130	36	40	45	55
Release time [ms]	44	49	54	67	41	45	50	62	31	35	39	48	24	26	29	36
Rated power [W]	28				65				98				470			
Armature weight [kg]	0,41															
Solenoid weight [kg]	2,04															
Insulation class	B															

Designation	LCL070080A01																			
Duty cycle [%]	100					40					25					5				
Stroke [mm]	5	10	15	20	30	5	10	15	20	30	5	10	15	20	30	5	10	15	20	30
Response time [ms]	266	295	328	365	450	186	207	230	255	315	103	115	128	142	175	35	39	44	49	60
Release time [ms]	48	53	59	66	81	47	52	58	65	80	34	38	42	47	58	25	28	31	35	43
Rated power [W]	39					95					150					680				
Armature weight [kg]	0,63																			
Solenoid weight [kg]	3,25																			
Insulation class	B																			

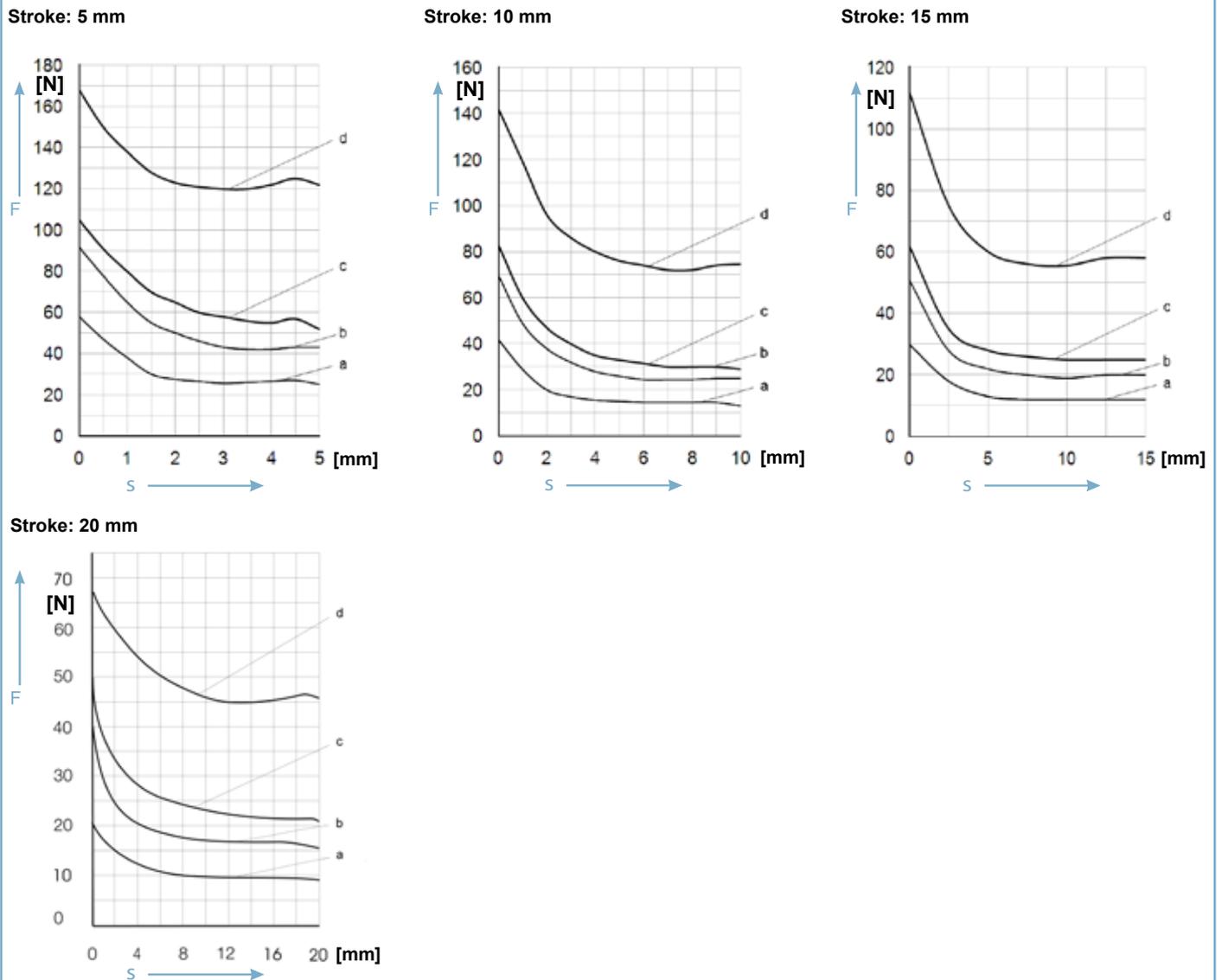
Stroke Force Curves

LCL030035A02 (43 11603D50)



Duty cycle: a = 100%, b = 40%, c = 25%, d = 5%, Values in brackets = old designation

LCL040050A02 (43 11604E50)

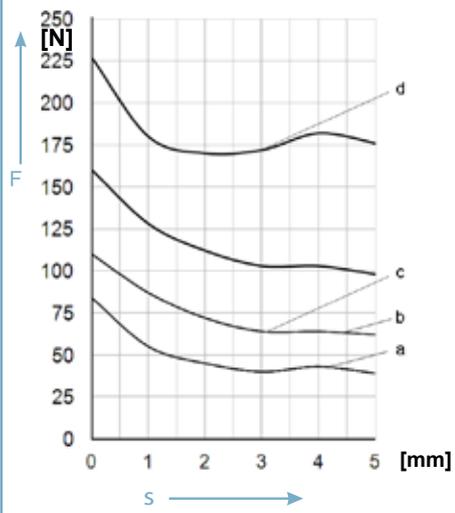


Duty cycle: a = 100%, b = 40%, c = 25%, d = 5%, Values in brackets = old designation

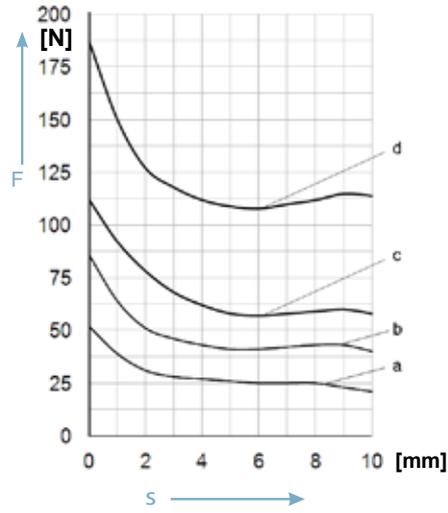
Stroke Force Curves

LCL048060A02 (43 11605D50)

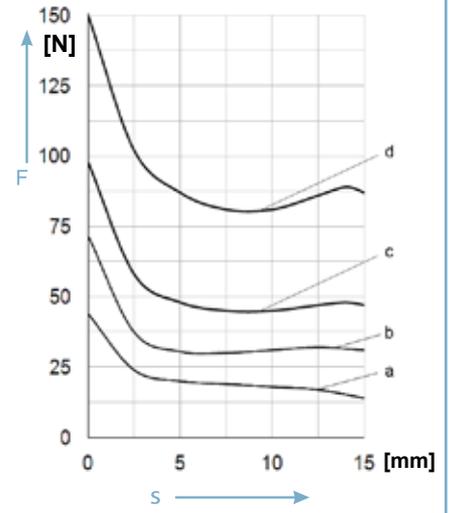
Stroke: 5 mm



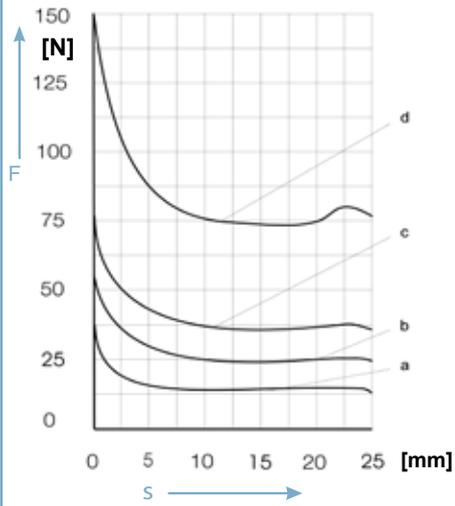
Stroke: 10 mm



Stroke: 15 mm



Stroke: 25 mm

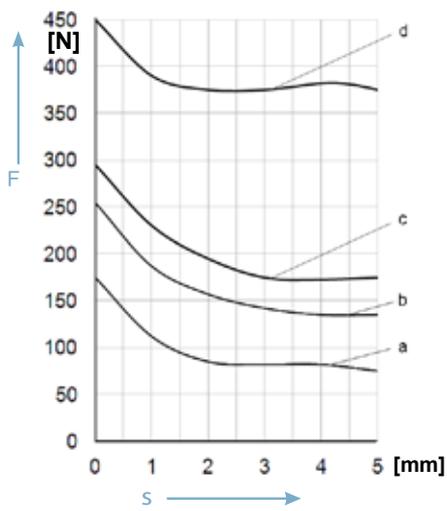


Duty cycle: a = 100%, b = 40%, c = 25%, d = 5%, Values in brackets = old designation

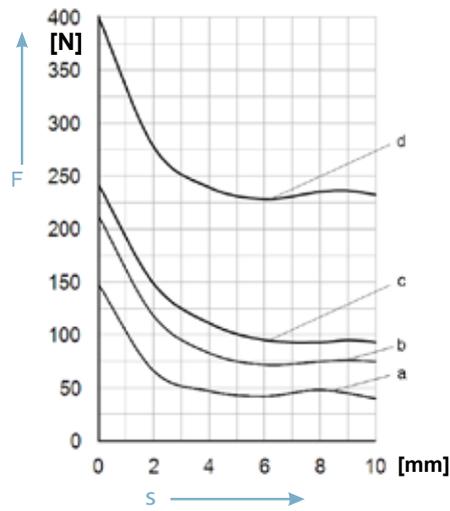
Stroke Force Curves

LCL060070A03 (43 11606D50)

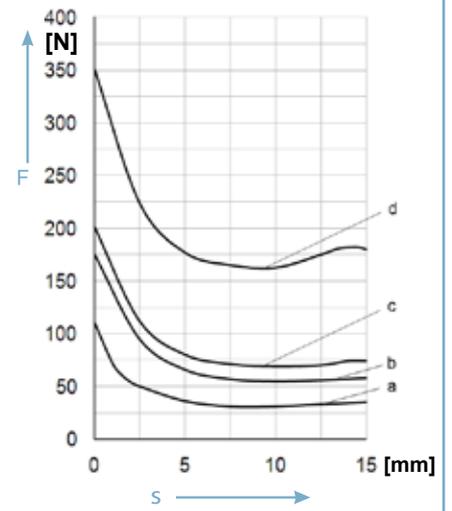
Stroke: 5 mm



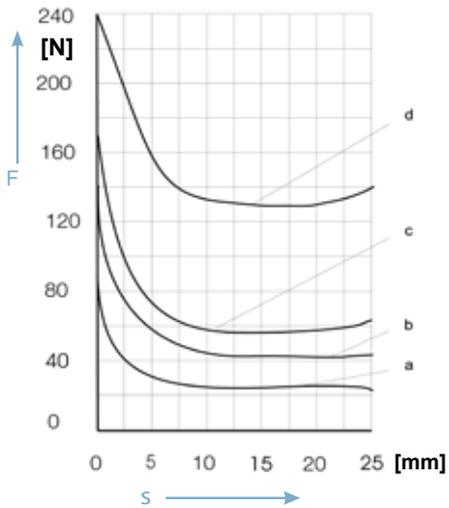
Stroke: 10 mm



Stroke: 15 mm



Stroke: 25 mm

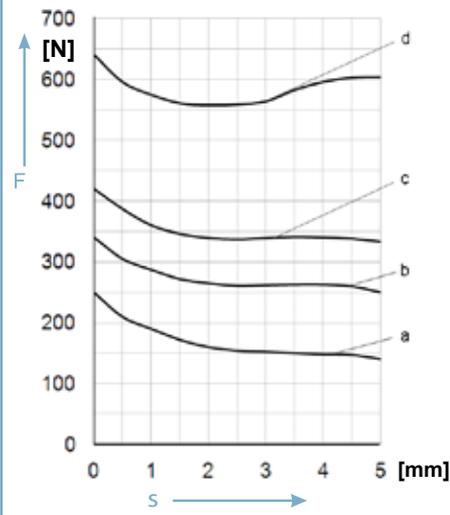


Duty cycle: a = 100%, b = 40%, c = 25%, d = 5%, Values in brackets = old designation

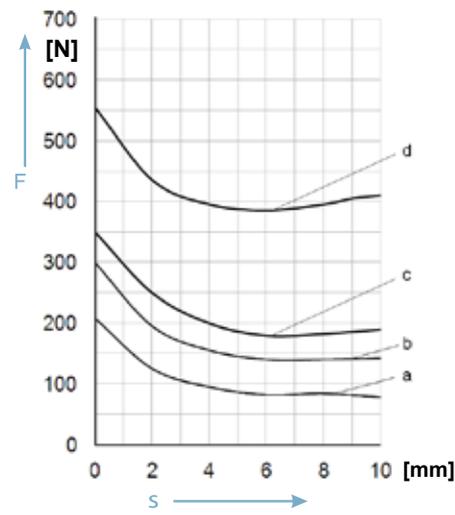
Stroke Force Curves

LCL070080 (43 11607D50)

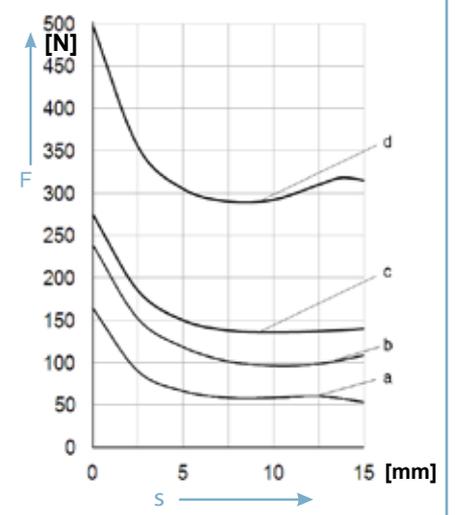
Stroke: 5 mm



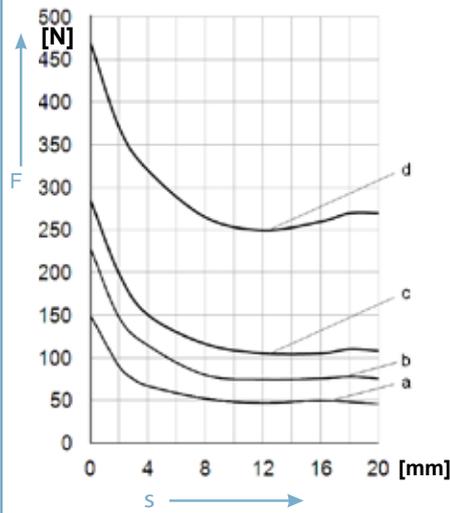
Stroke: 10 mm



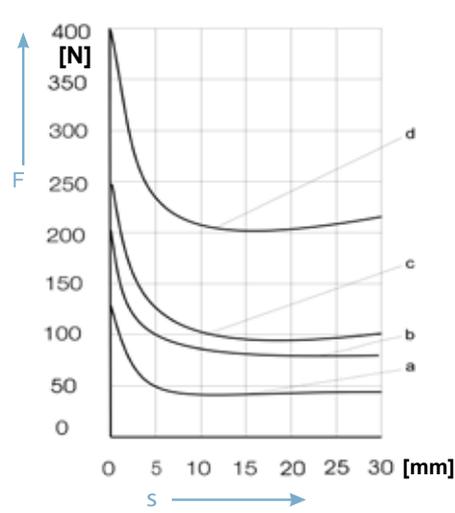
Stroke: 15 mm



Stroke: 20 mm



Stroke: 30 mm



Duty cycle: a = 100%, b = 40%, c = 25%, d = 5%, Values in brackets = old designation



LCM010015A00- LCM025030A00

Monostable direct acting solenoids of the LCM type series are single-action solenoids for short as well as intermittent duty with an ascending force-stroke characteristic. After the response phase integral permanent magnets hold the armature in the end position with a certain holding force in the de-energised state. Essentially, the electromagnetic force is used for the linear movement and the permanent magnetic force to hold the armature in the end position without the need for electrical power.

The release of the permanent magnetic force can be triggered by a voltage pulse. By using a compression spring this monostable version can be transformed into a bistable model. The armature is set back to the start position and held by a spring force.

The armature is guided in wear-resistant maintenance-free bearings on both sides.

Model

Device - insulation class IP40
 Lead wires – insulation class IP00
 Standard rated voltage = 24 V DC / 205 V DC

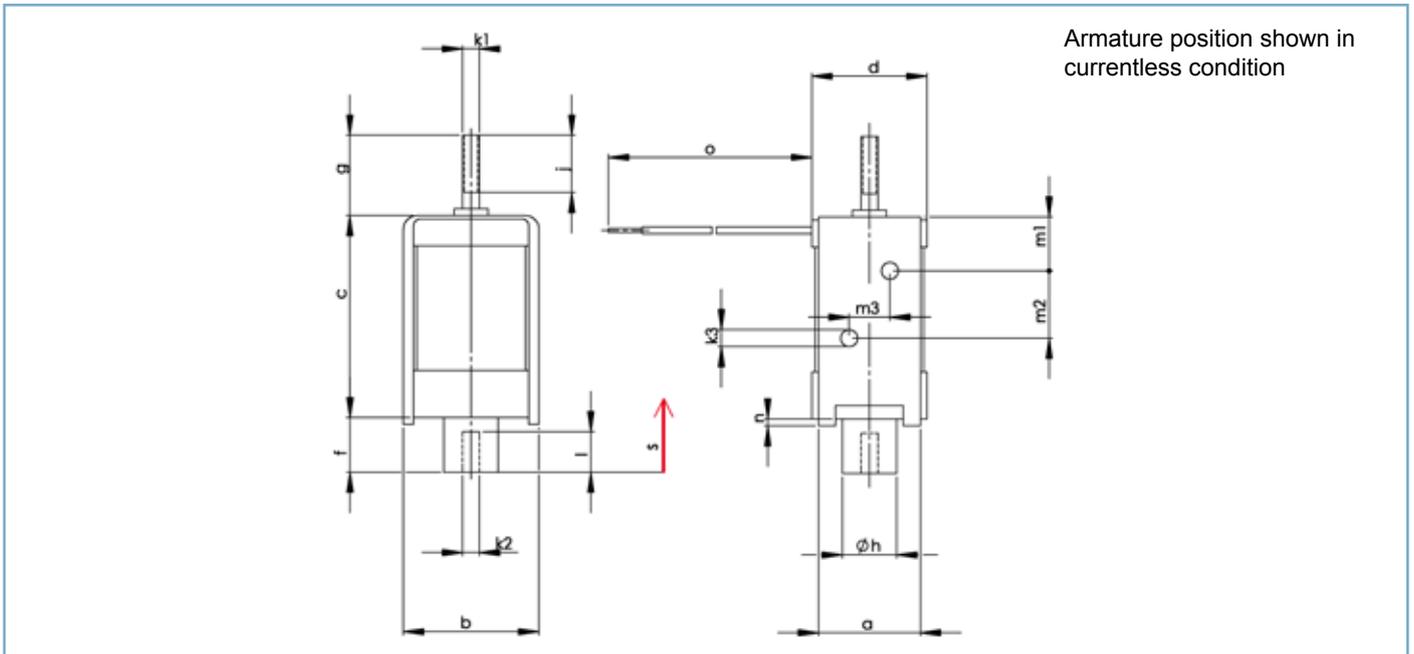
Installation notes

Lateral mounting of the solenoid via thread

Accessories

- return spring possible with some types
- fork head

Cross section



Dimensions in mm

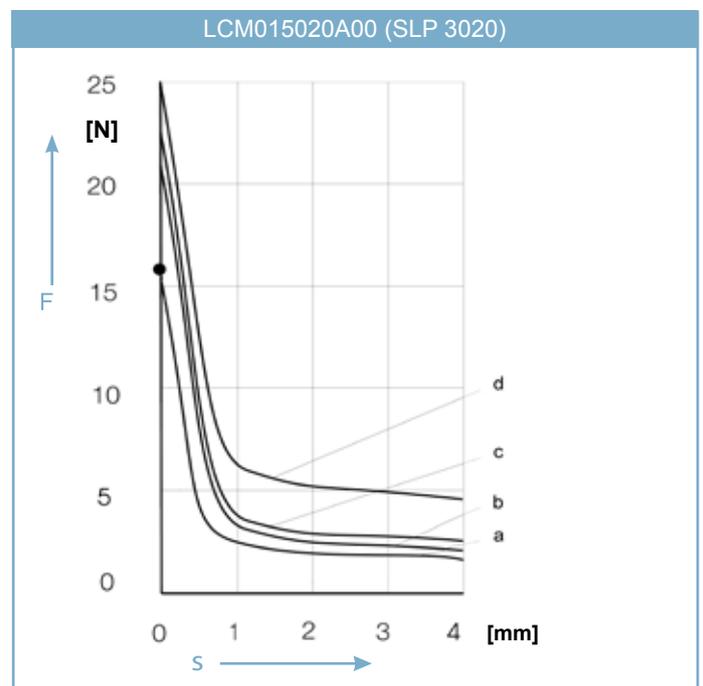
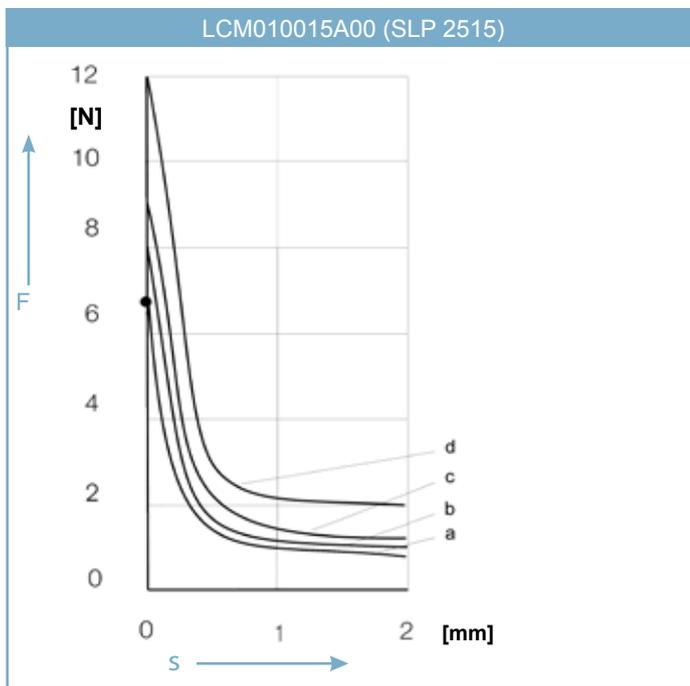
Designation	a	b	c	d	e	f	g	h	j	k1	k2	k3	m1	m2	m3	l	n	o
LCM010015A00	10	15	25	12	2	4	10	6	7	M3	M3	M3	8	15	8	6	1	130
LCM015020A00	15	20	30	17	4	6	10	8	9	M3	M3	M3	8	10	6	6	1	130
LCM024030A00	24	30	40	25	8	10	10	12	9	M3	M3	M3	10	10	14	6	1	130
LCM025030A00	24	30	60	25	8	10	10	12	9	M3	M3	M3	10	20	14	6	1	130

Technical Data

Designation	LCM010015A00				LCM015020A00				LCM024030A00			
Duty cycle [%]	100	40	25	5	100	40	25	5	100	40	25	5
Stroke [mm]	2				4				8			
Response time [ms]	45	37	34	30	60	56	54	50	80	75	70	60
Pull-in power consumption [W]	2,6	4,5	6	15,8	3,7	7,1	9,9	30,6	6,6	13,5	19,8	70,4
Armature weight [kg]	0,005				0,011				0,032			
Solenoid weight [kg]	0,022				0,045				0,15			
Protection class [IP]	IP00				IP00				IP00			
Insulation class	E				E				E			

Designation	LCM025030A00			
Duty cycle [%]	100	40	25	5
Stroke [mm]	8			
Response time [ms]	83	75	75	70
Pull-in power consumption [W]	9,1	19	28	104
Armature weight [kg]	0,045			
Solenoid weight [kg]	0,225			
Protection class [IP]	IP00			
Insulation class	E			

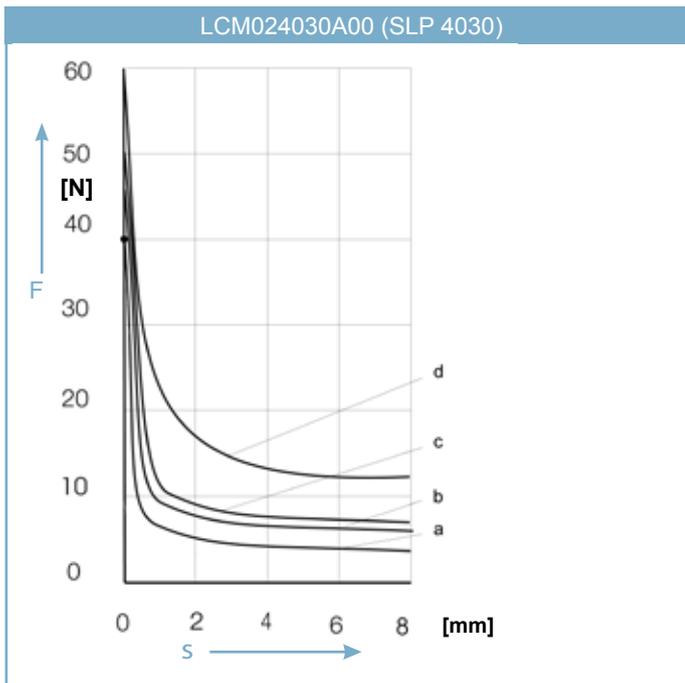
Stroke Force Curves



Duty cycle :
 a = 100% b = 40% ;
 c = 25% d = 5%
 Values in brackets = old designation
 • Permanent-magnetic holding force with air gap „0“

Duty cycle:
 a = 100% b = 40% ;
 c = 25% d = 5%
 Values in brackets = old designation
 • Permanent-magnetic holding force with air gap „0“

Stroke Force Curves

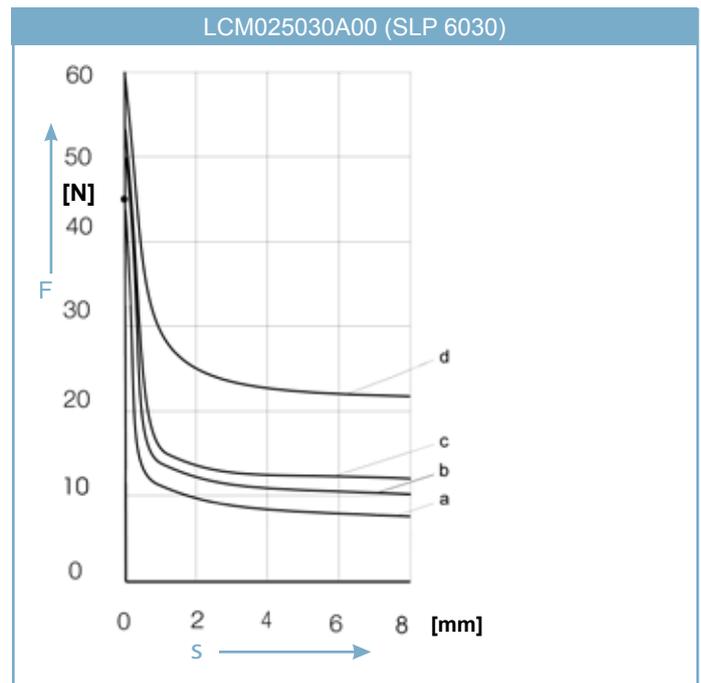


Duty cycle :

a = 100% b = 40% ;
c = 25% d = 5%

Values in brackets = old designation

• Permanent-magnetic holding force with air gap „0“

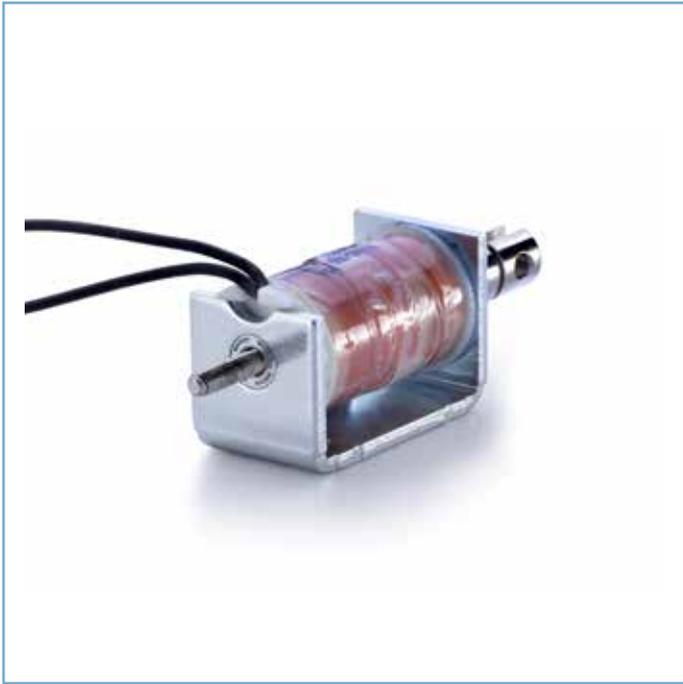


Duty cycle :

a = 100% b = 40% ;
c = 25% d = 5%

Values in brackets = old designation

• Permanent-magnetic holding force with air gap „0“



40 00118AE29

The direct acting solenoid 4000118AE29 is a closed-frame solenoid with armature, punched bracket and two plates. The armature is guided in highly wear-resistant maintenance-free precision bearings on both sides.

For shorter duty cycles a brass or plastic tube bearing is used. The solenoid is mounted to the bracket base by means of threads. Parts at risk of corrosion are galvanized and passivated acc. EN 12329. The armature is galvanically nickel-plated acc. EN ISO 4526. The stroke movement takes place from the stroke starting position to the stroke stop position by electro-magnetic forces, whereas the reset is accomplished by a pressure spring.

The solenoids can be installed in any position. The force transfer should be in axial direction only. Lateral load results in increased wear of bearing. If the solenoid is to be connected to an AC voltage of 230 V it can also be delivered with integrated bridge rectifier.

Model

Insulation class IP00
 Standard rated voltage = 24 V DC
 Standard duty cycle = 100% ED

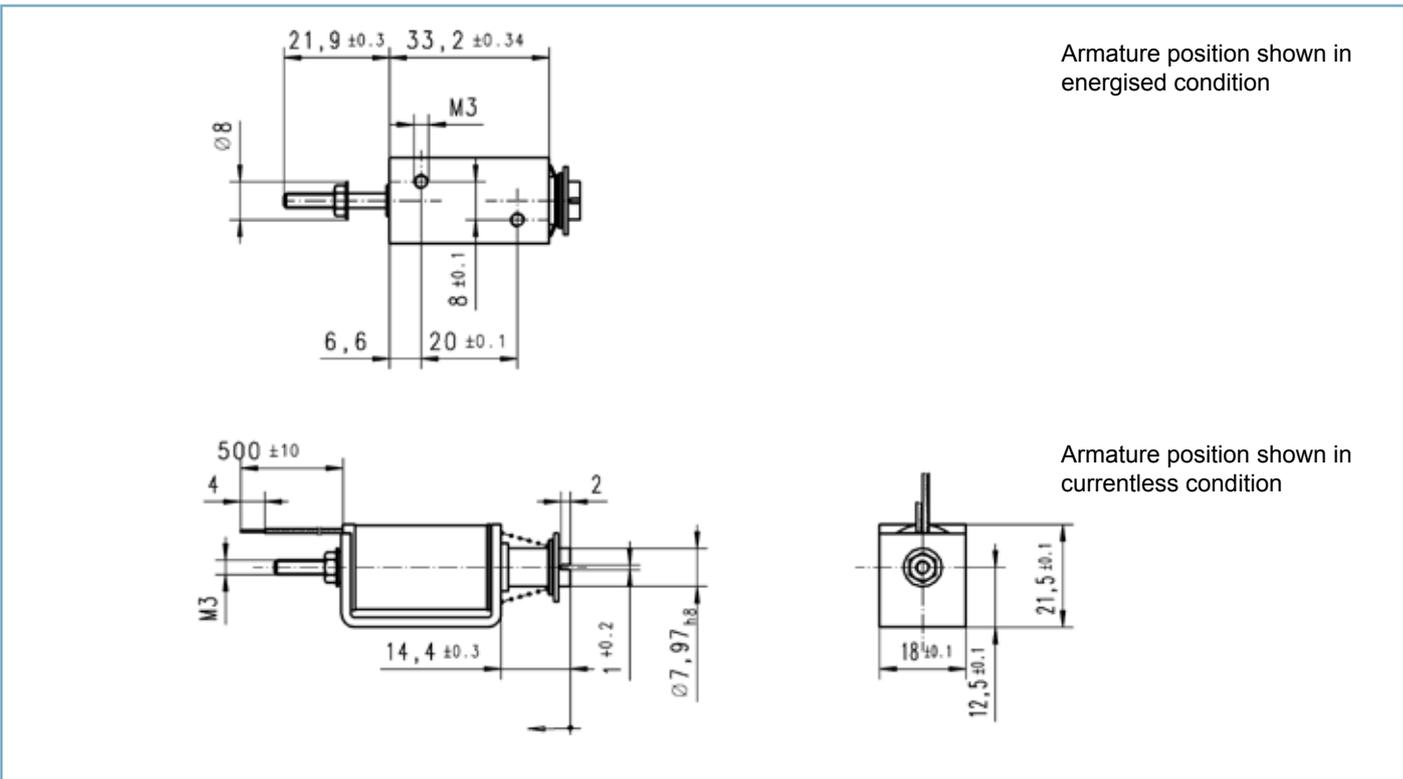
Installation Notes

Lateral mounting of the solenoid via thread

Accessories

- return spring possible
- fork head

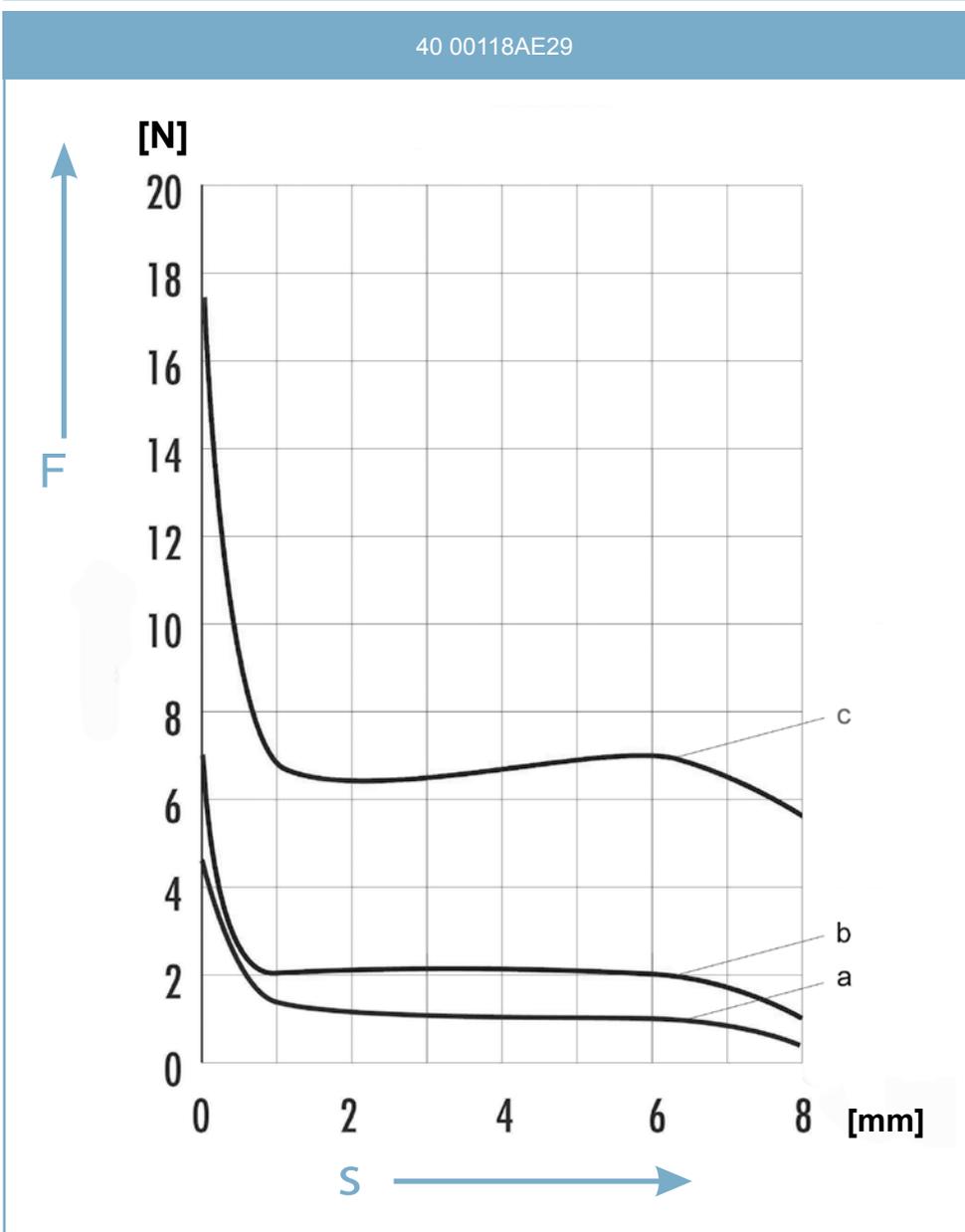
Dimension Drawing



Technical Data

Designation	40 00118AE29			
Duty cycle [%]	100	40	25	5
Stroke [mm]	8			
Rated power [W]	6	11,1	15	71,1
Armature weight [kg]	0,015			
Solenoid weight [kg]	0,060			
Protection class [IP]	IP00			
Insulation class	F			

Stroke Force Curves



Duty cycle :

a = 100%

b = 40% ;

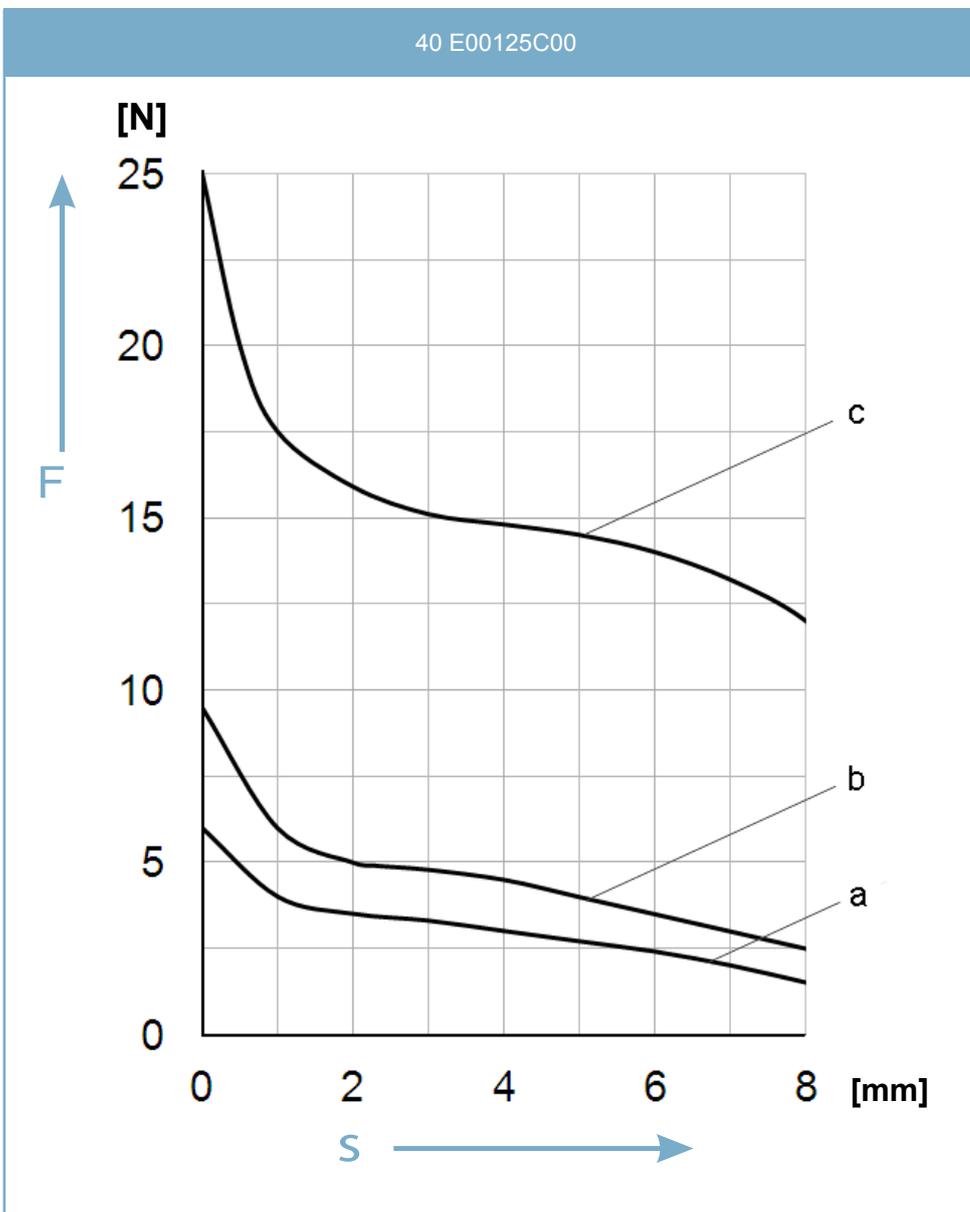
c = 5%

Values in brackets = old designation

Technical Data

Designation	40 E00125C00			
Duty cycle [%]	100	40	25	5
Stroke [mm]	8			
Rated power [W]	9,2	17,3	36	152
Armature weight [kg]	0,025			
Solenoid weight [kg]	0,123			
Protection class [IP]	IP00			
Insulation class	F			

Stroke Force Curves



Duty cycle :

a = 100%

b = 40% ;

c = 5%

Values in brackets = old designation



40 00628AE34

The DC single direction linear solenoid 4000628AE34 is a closed-frame solenoid with armature, punched bracket and two plates. The armature is guided in highly wear-resistant maintenance-free precision bearings on both sides. For shorter duty cycles a brass or plastic tube bearing is used.

Parts at risk of corrosion are galvanised and passivated acc. EN 12329. The armature is galvanically nickel-plated acc. EN ISO 4526. The stroke movement takes place from the stroke starting position to the stroke stop position by electro-magnetic forces, whereas the reset is accomplished by a pressure spring. The solenoids can be installed in any position. The force transfer should be in axial direction only.

Lateral load results in increased wear of bearing. If the solenoid is to be connected to an AC voltage of e.g. 230 V it can also be delivered with rectification.

Model

Lead wires
 Insulation class IP00
 Standard rated voltage = 24 V DC
 Standard duty cycle = 100% ED

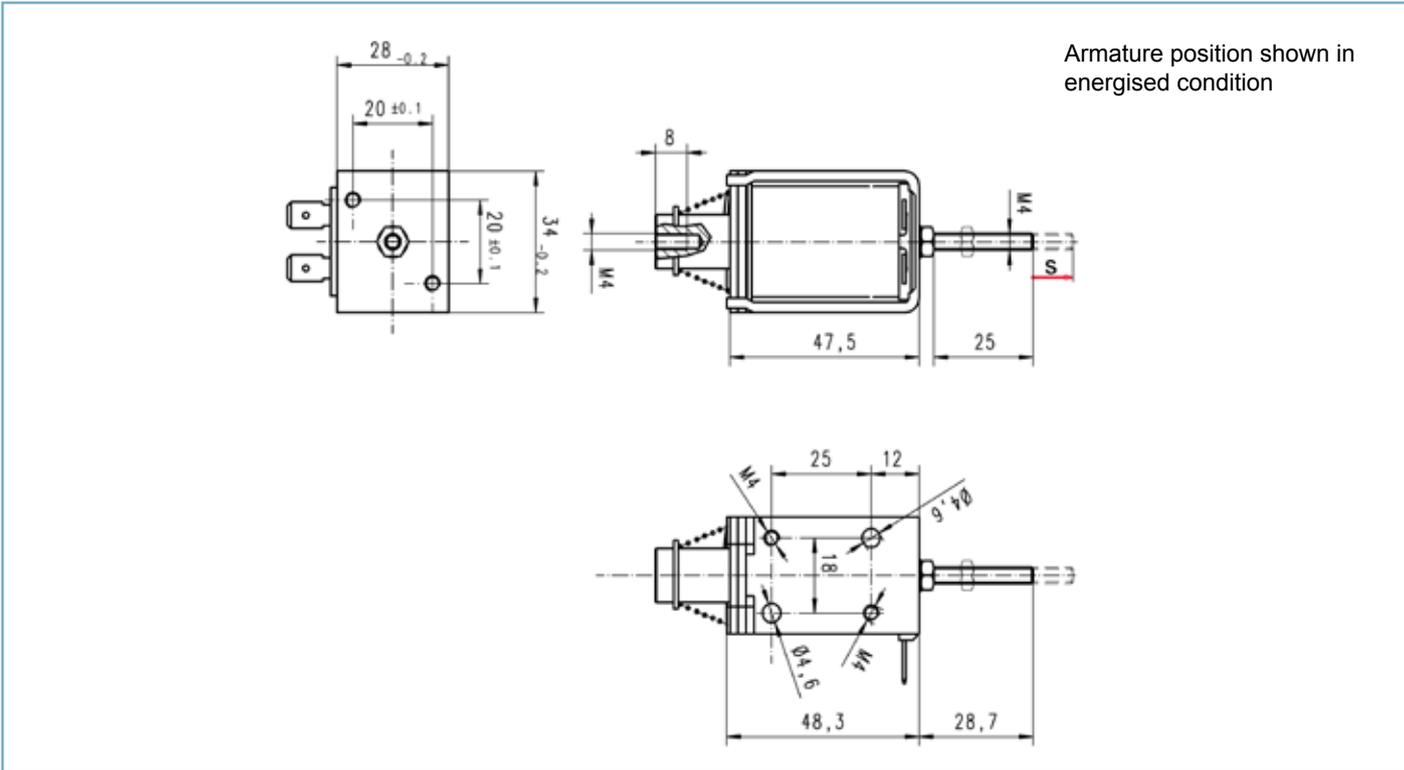
Installation Notes

Lateral mounting of the solenoid via thread

Accessories

- return spring
- fork head

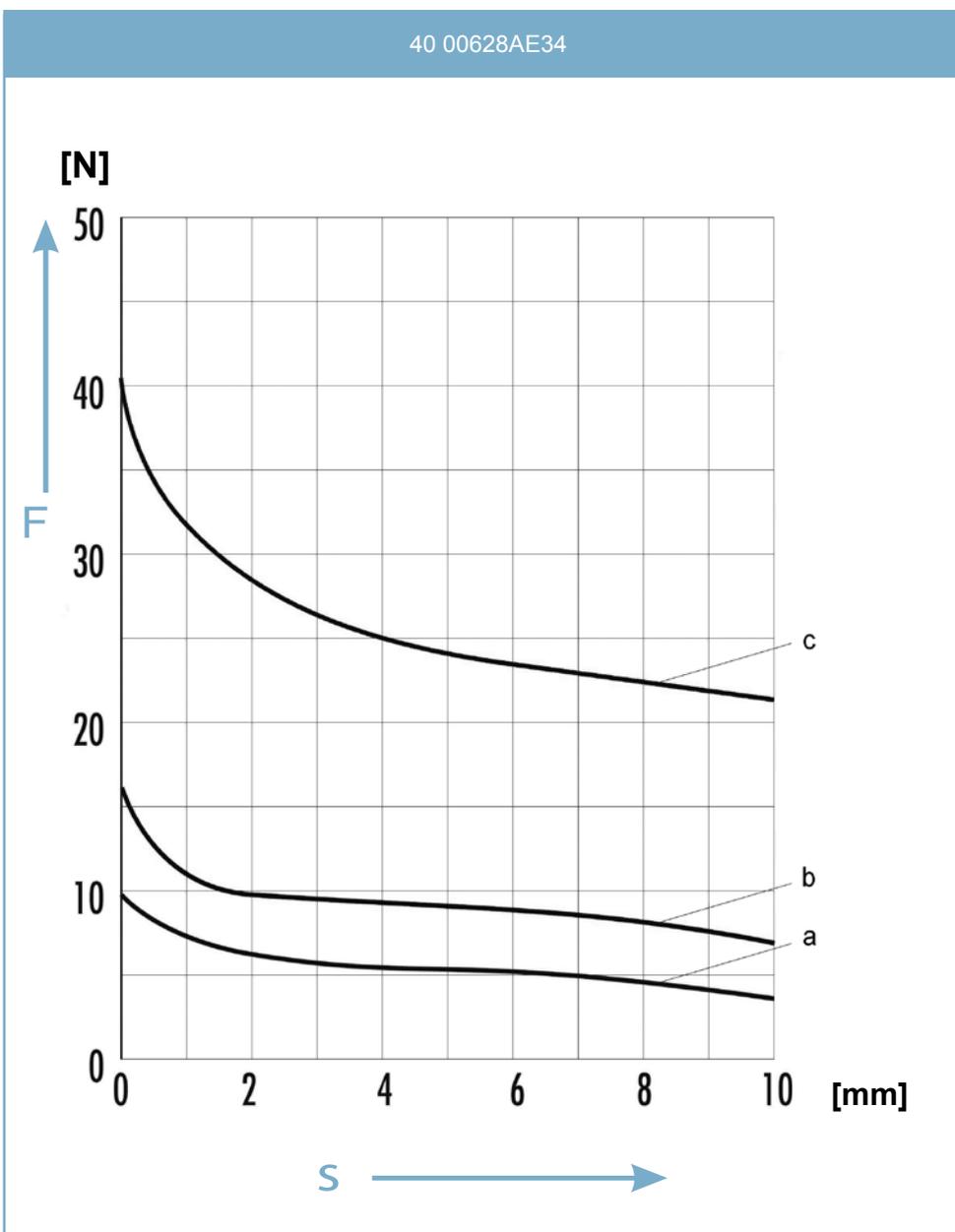
Dimension Drawing



Technische Daten

Designation	40 00628AE34			
Duty cycle [%]	100	40	25	5
Stroke [mm]	10			
Rated power [W]	13,4	25,6	51	180
Armature weight [kg]	0,046			
Solenoid weight [kg]	0,225			
Protection class [IP]	IP00			
Insulation class	F			

Stroke Force Curves



Duty cycle :

a = 100%

b = 40% ;

c = 5%

Values in brackets = old designation

Accessories



Spring set

A spring is clamped at the armature by means of a screw and a disc. As the spring is mounted to the outside of the solenoid this accessory cannot be mounted to the models IP54 with bellow.

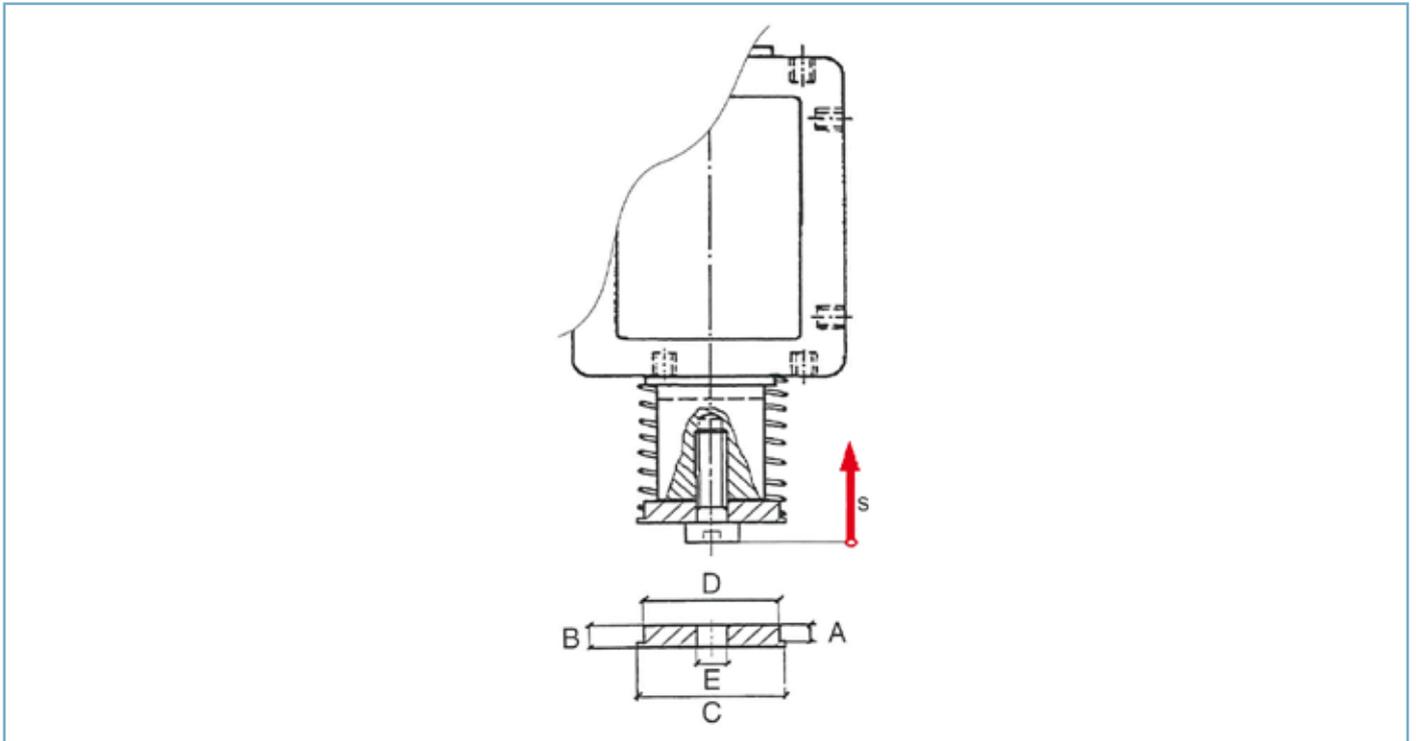
In larger quantities the spring set can be delivered pre-assembled with the solenoid. For smaller quantities the spring set can be delivered in a handy plastic bag.

The assembly is very easy, only an Allen key is required.

Installation Notes

Magnetic force is reduced by spring force.

Cross section



Reset spring set for type	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F _n [N]
LCL030035	4	9	19	17	4,2	0,55
LCL040050	8,5	10,5	26	23	6,2	1,23
LCL048060	9	12	31	28	8,2	2,26
LCL060070	13	16	37,5	34	8,2	4,02
LCL070080	18	22	42,5	39	10,2	6,18

Accessories



Plug-in connector acc. DIN EN 175301

The 2-pole plug-in connector with protective lead is a connection specially designed for electro-magnetic devices.

The cable outlet can be rotated 4 x 90° by inserting the contact carrier accordingly.

After attaching the plug-in connector to the pin plate of the device plus sealing it is secured with a machine screw supplied. This guarantees an exact seal of the combination and prevents the plug-in connector from being accidentally detached under vibration.

A cable gland Pg 11 (material no. 430006) serves to seal the cable. The contact elements are suitable for connecting-wire cross sections of up to 1.5 mm². Air clearance and leakage paths acc. VDE 0110.

Technical Data

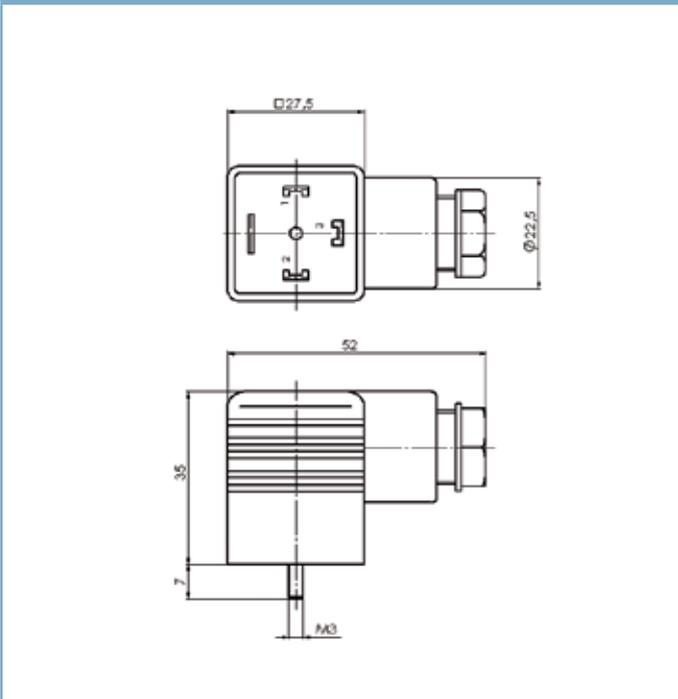
Insulation class C
Protection class IP 65 (in plugged in and secured condition)
Plug load 2.5 A

Model

- Type 430006 (large) design A
- Type 430001 with integrated bridge rectifier

Dimension Drawing

Plug-in connector design A



Accessories

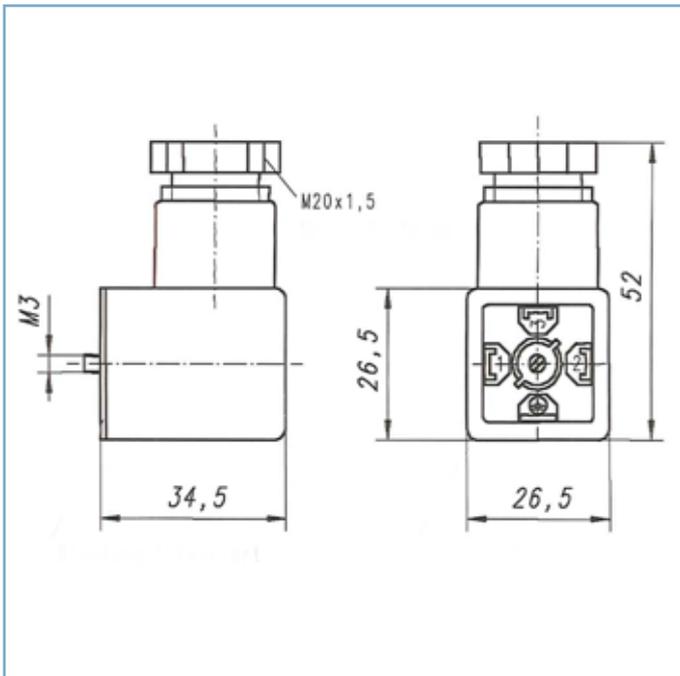


Switching device TYPE 33 53501A00

The use of these switching devices with overexcitation serves to increase the attraction force and to reduce the response time of electromagnetically operated actuators. Depending on the design these switching devices can also be used in economy mode circuits.

Supplying the actuators with a higher current for a limited time when switching on and subsequently lowering the voltage to the holding voltage results in a number of operational advantages: increased attraction force, faster switching time, lower energy consumption, less temperature rise and higher life expectancy.

The holding voltage can be adjusted by a potentiometer. The power supply to the actuator is indicated by means of an LED. The device is protected against transient surge voltages and polarity reversal. By integrating this device into a valve connector it is possible to connect it to all actuators with plugs acc. DIN EN 175301-803 (DIN 43650).



CE

These products comply with the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC. In accordance with the Machinery Directive 98/37/EEC the products are components which may not be operated until the conformity of the machines, into which these components are installed, with the EC directive has been established.

Installation Notes

During the overexcitation time the operating voltage (minus approx. 1.5 V) is applied to the actuator, afterwards it is switched according to the holding voltage. Make sure that the total power input does not exceed the rated power of the device connected. Remove the switching device from the actuator only after the power supply has been disconnected. The device must only be operated within its limits as otherwise an overload may occur. Switching off the power supply during the overexcitation time (after less than 100 ms) is not permissible as a permanent solution because this might lead to an overload.

Warning! The device must be set and operated in such a way that the values for maximum overexcitation current, maximum holding current and maximum switching frequency, as given in the technical specification, are not exceeded and the minimum recovery time is maintained.

Setting:

Use a screwdriver (blade 2.5 x 0.5 mm) to set the holding voltage. The holding voltage can be measured by connecting a multimeter between connections 1 and 2.

Accessories

Technical Data

Designation	TYP 33 53501A00
Input voltage U_{in}	18...36 VDC
Residual ripple	< 10%
Overexcitation voltage U_{in}	- 1,5 VDC
Holding voltage adjustable	20 ...50 %
Max. output current with overexcitation	2 A
Max. output current with holding excitation	0,8 A
Overexcitation time	100 ms \pm 20 ms
Min. activation time	150 ms
Recovery time	>100 ms
Max. switching frequency	4 Hz
Temperature range	-20...+70 °C
Housing acc.	DIN EN 175301-803, (DIN 43650)/ISO 4400
Contact pitch	18 mm
Max. wire cross-section	max. 1,5 mm ²
Cable gland	M20x1,5
Cable diameter	8...10 mm
Protection class (installed)	IP65 nach IEC 60529
Housing material	PA(+G)
Holding voltage	40 % der Eingangsspannung

Accessories



Fork head acc. DIN 71752

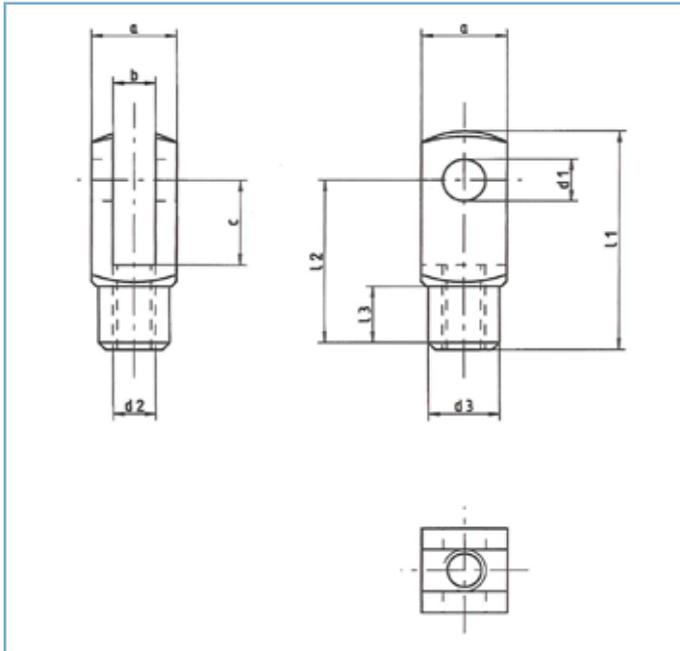
Fork heads are used to connect all types of linear solenoids to force-transfer elements such levers, push bars, valve flaps and sliding dampers. In many cases they enable rapid connection during assembly and also quick replacement of wear and spare parts.

With types without snap-on fork pins the force-transfer between fork head and operating part is achieved by means of a cylindrical pin with the usual locking elements. The use of a fork head with snap-on fork pin results in a quickly assembled and readily detachable connection (no tools required) between the linear solenoid and the component.

The fork heads are electrogalvanised.

Installation Notes

With its thread the fork head is screwed to the pull or push bar of the linear solenoid and secured with a locknut.



Dimensions in mm

Designation	a	b	c	d1	d2	d3	i1	i2	i3
GK 0	8	4	8	4	M3	8	21	16	6
GK 1	8	4	8	4	M4	8	21	16	6
GK 2	10	5	10	5	M5	9	26	20	8
GK 3	12	6	12	6	M6	10	31	24	9
GK 4	16	8	16	8	M8	14	42	32	12
GK 5	20	10	20	10	M10	18	52	40	15
GK 6	24	12	24	12	M12	20	62	48	18

Accessories



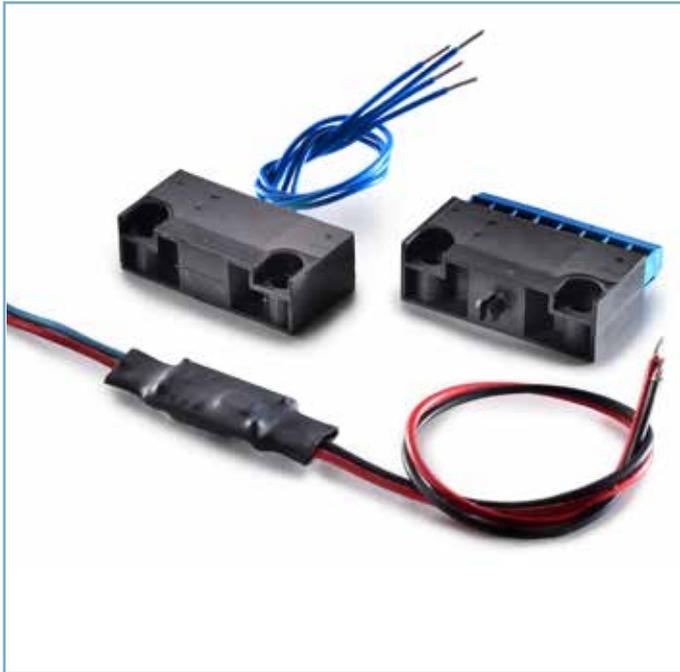
Snap-on fork pins acc DIN 71752

The use of a fork head with snap-on fork pin results in a quickly assembled and readily detachable connection (no tools required) between the linear solenoid and the component. The spring clip ensures that the fork pin remains securely in position. The fork heads are electro-galvanised, the fork pins phosphatised.

Installation Notes

After attaching the plug-in connector to the pin plate it is secured with a machine screw supplied. This guarantees an exact seal of the combination and prevents the plug-in connector from being accidentally detached.

Accessories



MPR Micro Power Regulator for electromagnetic devices

The MPR Micro Power Regulator is designed for optimised control of inductive loads such as brakes, solenoids and valves. The electronic module uses pulse-width modulation to keep the voltage or current supplied to the electromagnetic device at a constant level over a wide input voltage and temperature range.

The full operating voltage is applied for a limited period of time to ensure fast and powerful switching when the load is switched on. Subsequently, the MPR module reduces the power supply to constant holding voltage or holding current. A 30% reduction will provide power savings of 50%.

In addition to this benefit, lower intrinsic heating of the load extends the operating temperature range. An optional LED can be included. The MPR module is very compact thanks to the use of state-of-the-art microelectronics and power electronics components. Programmable factory settings to meet specific customer requirements include over-excitation time as well as holding voltage and current.

Technical Data

Operating principle		Controlled pulse-width modulation (PWM)		
Pulse-width modulation PWM [%]		70	other PWM settings upon request (10% bis 70%)	
Ambient temperature [°C]		-20 ... 70		
Input voltage range [V DC]		18V ... 40		
Overexcitation voltage [V DC]		bis 30	input voltage or max. 30 V controlled voltage	
Overexcitation time [ms]		200	other time settings upon request	
Output current [A]		2,5		
Voltage control through PWM, base frequency [Hz]		500	other frequency settings upon request	
Type	Rated input voltage U_1 (Tol.: ±10%)	Max. output current [ADC]	Housing W x H x D [mm]	Connections
34 17125Axx	18 – 40 V	2,0	42 x 30,5 x 13	4 stranded wires 0.5 mm ² fine-wire / to UL 1007 / 1569 (AWG 20)
34 17325Axx	18 – 40 V	2,0	42 x 30,5 x 13	4 terminals (max. 2.5 mm ² single-wire or 1.5 mm ² stranded wire)
34 10125Axx	18 – 40 V	2,0	27 x 14 x 8	4 stranded wires 0.5 mm ² fine-wire / to UL 1007 / 1569 (AWG 20) (heat-shrink protected module)

CE

EMC Directive 2004/108/EEC:
Compliance with the following standards is confirmed:
EN 50081-2 (Emission):
EN 55011 (VDE 0875, part 11, 1992)
Group 1, Class A conducted interference
Group 1, Class B radiated interference
EN 61000-6-2 (Immunity):
EN 61000-4-3 (1997) severity level 3
EN 61000-4-4 (1996) severity level 3
EN 61000-4-5 (1996) severity level 3

Low Voltage Directive 2006/95/EWG:
Komponente, entspricht den Normen:
HD625.1S1 (1996) (VDE 0110)
Insulation coordination EN 60529 (1991)
IP54 external mounting.
Machinery Directive 2006/42/EG:

These products are considered components in the sense of Machinery Directive 2006/42/EC and must not be put into service until the machinery in which they are incorporated has been declared in conformity with the provisions of the EC Directives.

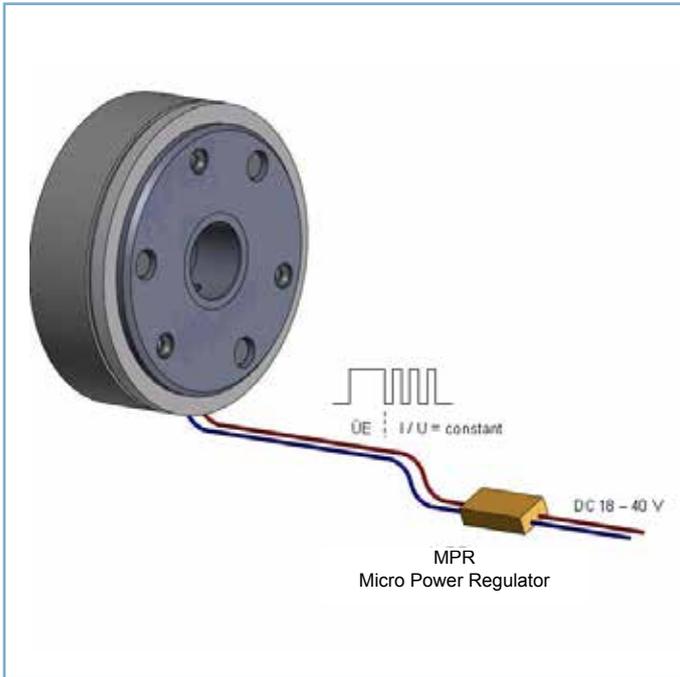
Protection:
Versions 34 17125Axx and 32 17325Axx to EN 60529:IP 54

Version 34 10124Axx to EN 60529: IP 50

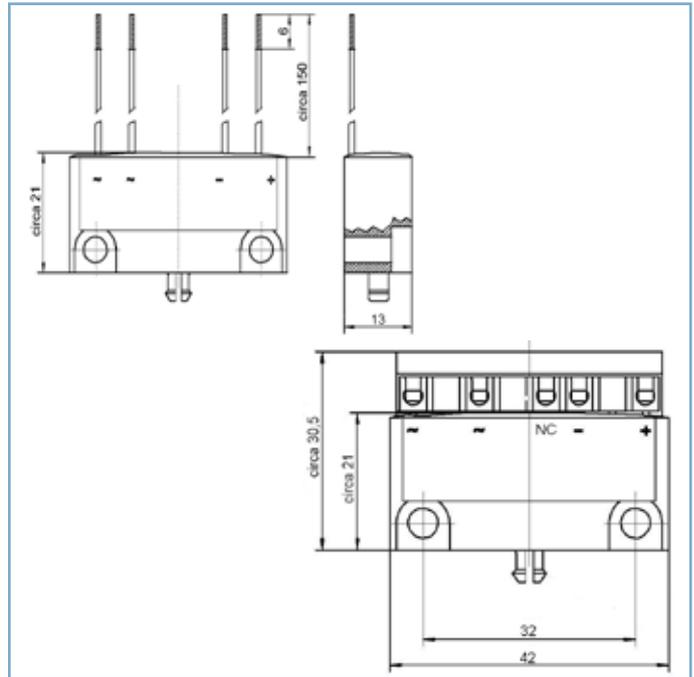
Subject to change without notice.

Accessories

Connection example



Dimensions / Housing [mm]



MPR Types

Type	Current / Voltage U_N / I_N	Holding current / voltage	Comments
34 1xx25A00	24 V	10-90 % U_N	programmable
34 1xx25A01	24 V	70 % U_N	
34 1xx25A02	24 V	50 % U_N	
34 1xx25A20	2 A	0,1 A - 2 A	programmable

Voltage control type 34 1xx25Axx

The Micro Power Regulator keeps the control voltage supplied to the electromagnetic device at a constant level over a wide input voltage range. When the device is switched on, the full supply voltage is applied on a time-controlled basis to ensure fast and powerful switching.

Depending on the specific application, the controlled holding voltage applied after this initial phase can be factory-set to between 10 and 90% of the rated voltage to ensure ideal operating conditions.

This solution offers substantial power savings along with a wider operating temperature range thanks to reduced intrinsic heating. The voltage control type MPR is preferably used with permanent-magnet brakes.

Connections

Colour for stranded wire type	Identification on housing
U_{IN} red	BA1
U_{IN} blue	BA2
U_{OUT} red	BD1
U_{OUT} black	BD2

Current control type 34 1xx25Axx

Current variations resulting from temperature and control voltage variations are compensated to keep the torque constant.

Peak current is only applied for a limited period of time and then reduced to holding current.

Depending on the specific application, the holding current can be factory-set to between 10 and 90% of the rated current. The module is factory-adjusted to the turn-on current of the electromagnetic device. The current control type MPR is ideal for use with spring-applied brakes and linear solenoids.

Technical Explanations

Thermal Classes

As shown in the table below thermal classes are classified according to DIN VDE 0580 / 07.2000 into insulation classes on the basis of their long-term thermal stability. Depending on the type our linear solenoids are manufactured in thermal classes E, B and F. If required by the application most devices can also be delivered in thermal class H.

Thermal class	Limit temperature °C	Limit over-temperature °C
Y	90	50
A	105	65
E	120	80
B	130	90
F	155	115
H	180	140

Protection Classes [IP]

Protection classes are indicated by a short symbol consisting of the two invariable code letters IP and two code letters for the degree of protection. The protection classes indicated are determined according to IEC 60529. They apply to protection against contact and against penetration of foreign substances. The second code letter applies to protection against penetration of water.

In case the protection class of e.g. the electrical connection deviates from that of the solenoid the protection class of the connection is indicated separately, e.g. housing IP 54, connection IP 00.

Code Letters Protection against contact and foreign substances	
0	no protection
1	protection against big foreign substances
2	protection against medium-sized foreign substances
3	protection against small foreign substances
4	protection against grain-shaped foreign substances
5	protection against dust deposit
6	protection against dust penetration

Code Letters Protection against water	
0	no protection
1	protection against vertical dripping water
2	protection against dripping water falling at an angle
3	protection against spray water
4	protection against splashing water
5	protection against hose water
6	protection against flooding
7	protection against immersion
8	protection against submersion

Rated Modes of Operation

Continuous operation is the operation during which the duty cycle is so long that the steady-state temperature is reached. Intermittent operation is the operation during which duty-cycle and currentless break alternate in regular and irregular intervals, the breaks being so short that the device cannot cool down to the reference temperature.

Short time operation is the operation during which the duty cycle is so short that the steady-state time is not reached. The currentless break is so long that the solenoid cools down to the reference temperature.

Technical Terms Related to Electricity

The rated voltage (UN) is the voltage with which the solenoid is operated in normal operation. The rated power (PN) is the power which results from the rated voltage and the rated current with DC solenoids of a coil temperature of 20°C.

The rated current (IN) is the current which results from the rated voltage (UN) and the resistance (R20) with a coil temperature of 20°C.

Technical Terms Related to Force

Magnetic force is the exploitable mechanical force reduced by the friction which is generated in stroke direction.

The magnetic force is safely reached with 90% rated voltage and maximum warming. With rated voltage the listed values rise by approx. 20%.

Stroke force is the magnetic force which acts outside taking the respective component of armature weight into consideration

Holding force is the magnetic force in stroke end position with DC-solenoids; with AC-solenoids it is the average value of the magnetic force periodically fluctuating with the alternating current in stroke end position.

Reset force is the force required to reset the armature into stroke start position after switching off the excitation current.

Relative duty cycle (% ED) is the ratio between duty cycle and cycle time in per cent. It is calculated according to the following formula:

$$\% \text{ ED} = (\text{duty cycle} / \text{cycle time}) * 100$$

In order to calculate the relative duty cycle the preferred value of the cycle time acc. DIN VDE 0580 item 3.2.2 of 5 minutes is usually taken as a basis.

If the cycle time is irregular the relative duty cycle is determined from the ratio between the sum of the duty cycles and the sum of the cycle times over a longer period of operation.

The maximum values of the duty cycle must not be exceeded. If the relative duty cycle was determined and its value exceeds the permitted maximum value acc. DIN VDE the higher %-ED has to be selected into the range of which the duty cycle fits in. (Tables 1 and 2)

Cycle time is the sum of the duty cycle and the currentless break. For DC-solenoids the cycle time is max. 5 minutes = 300s. This equals 12 switches per hour. The minimum cycle time is limited by the response and release times in connection with the relative duty cycle. For a cycle time of 300s there are maximum values for the duty cycle which must not be exceeded. In case the permitted duty cycle is exceeded a solenoid of the next higher relative duty cycle has to be selected.

If the duty cycle of 180s is exceeded the solenoid has to be selected for 100% ED (continuous energisation) or in special cases of the duty cycle calculated from the off/on ratio needs to be adapted by proper selection of the magnetic coil.

If the cycle time is irregular the relative duty cycle is determined from the ratio between the added duty cycles and the added cycle times over a longer period of operation.

Under playing sequence we understand a single or periodically returning sequence of values for cycle time.

Relative duty cycle (% ED)	5	15	25	40	60	100
Permitted maximum duty cycle (s)	15	45	75	120	180	random

Table 1

Switching number (S/h)	12		120		300		600		1200		3000		
	t _{on}	t _{off}											
Cycle time (s)	300		30		12		6		3		1,2		
% ED	5	15	285	1,5	28,5	0,6	11,4	0,3	5,7	0,15	2,85	0,06	1,14
	15	45	255	4,5	25,5	1,8	10,2	0,9	5,1	0,45	2,55	0,18	1,02
	40	120	180	12,0	18,0	4,8	7,2	2,4	3,6	1,20	1,80	0,48	0,72
	60	180	120	18,0	12,0	7,2	4,8	3,6	2,4	1,80	1,20	0,72	0,48
	100	beliebig											

Table 2

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WE MAGNETISE THE WORLD

Locations

Germany : Headquarters

Kendrion (Donaueschingen/Engelswies) GmbH
August-Fischbach-Straße 1
78166 Donaueschingen
Phone: +49 771 8009 0
Fax: +49 771 8009 3634
sales-ims@kendrion.com
www.kendrion.com

Germany : Headquarters

Kendrion (Donaueschingen/Engelswies) GmbH
Fred-Hahn-Straße 33
72514 Inzigkofen-Engelswies
Phone: +49 7575 208 0
Fax: +49 7575 208 3190
sales-ims@kendrion.com
www.kendrion.com

Germany: Technical Office

North-West
Mr. Wilhelm Martin
Bottroper Straße 15
46244 Bottrop-Kirchhellen
Phone: +49 2045 413434
Fax: +49 2045 406426
wilhelm.martin@kendrion.com
www.kendrion.com

Germany: Technical Office

North Rhine - Westphalia

VOR-Steuerungstechnik
Friedrich Rudolph GmbH
Schlaunstrasse 2
50309 Brühl
Phone: +49 2232 4179 131
Fax: +49 2232 4179 132
info@vor.de
www.vor.de

Germany: Technical Office

East

BRAUNE Industrievertretung
Griebnitzstraße 4a
14482 Potsdam
Phone: +49 3554 8377 54
Fax: +49 3554 8377 55
mail@braune-industrievertretung.de
www.Braune-Industrievertretung.de

Germany: Technical Office

Bavaria

Mr. Hans-Christian Pilder
Ablers 7
88175 Scheidegg
Phone: +49 8381 9487 61
Fax: +49 8381 9487 62
kendrion@pilder.de
www.kendrion.com

Austria

Kendrion (Linz) GmbH
Estermannstraße 27
4020 Linz
Phone: +43 732 776 383
Fax: +43 732 783 558
office@kendrion-binder.at
www.kendrion.com

China

Kendrion (Suzhou) Co. Ltd.
Factory Building No. 1
58 Yin Sheng Road
215126 Sheng Pu District
Suzhou Industrial Park
Phone: +86 512 8918 5002
Fax: +86 512 8918 5010
chn@kendrion.com
www.kendrion.com

England

Kendrion (UK) Ltd.
Huddersfield Road, Low Moor
Bradford
West Yorkshire, BD 12 OTQ
Phone: +44 12 7460 1111
Fax: +44 12 7469 1093
uk@kendrion.com
www.kendrion.com

Italy: Technical Office

Mr. Vincenzo Leo
Via San Francesco d'Assisi 22
10121 Torino
Phone: +39 011 3997 752
Fax: +39 011 3997 700
italy@kendrion.com
www.kendrion.com

Switzerland

Kendrion (Switzerland) AG
Albisstraße 26
8915 Hausen am Albis
Phone: 41 44 764 80 60
Fax: +41 44 764 80 69
ch@kendrion.com
www.kendrion.com

USA

Kendrion (Mishawaka) LLC
56733 Magnetic Drive
Mishawaka, IN 46545-7481
Phone: +1 574 257 2422
Fax: +1 574 257 2421
sales-mishawaka@kendrion.com
www.kendrion.com

For further contacts please refer to www.kendrion.com