ITALIANA RELE

SERIES PR

AC & DC Solenoids

Open frame linear solenoids designed for AC & DC applications. Both the frame and the plunger are made of solid steel construction. They can be operated in any position, turning an electric pulse into an axial pull or push-pull action. Coil winding insulation being in Class F. Performance, as shown in the following diagrams, is always referred to a temperature rise of 80°C in open air, with 35°C ambient temperature and coil fed at 105% of rated voltage (VDE 0580). Since the mechanical energy generated by all solenoids is a constant, any amount of that force eventually not utilised by relevant application will be expended under form of impact force. Consequently, any application should correctly use the smallest available solenoid performing the required action, whilst not exceeding the max admitted operational temperature. To select the right solenoid, also the exact determination of the duty cycle is equally essential: in fact, whenever the maximum cycle is exceeding 300 seconds, a continuously rated solenoid (ED=100) must be used. Otherwise the relative duty factor would result as follows:

$$ED\% = \frac{\text{ON time}}{\text{(On + OFF time)}} \times 100$$

(Cycle = ON + OFF time)

ON and OFF times corresponding to relative duty factors lower than ED=100 result, for standard ED values, from the following diagram:

Current values given in our diagrams are at nominal voltage. Forces shown are referred to solenoids fed @ 90% of rated voltage, with 'hot' coil at 20°C ambient temperature.

RELATIVE DUTY FACTOR (ED%)

Operation per hour	*Total cycle (seconds)*	**ED 40**		**ED 25**		**ED 15**		**ED 5**	
		ON	*OFF*	*ON*	*OFF*	*ON*	*OFF*	*ON*	*OFF*
12	**300**	120	180	75	225	45	255	15	285
120	**30**	12	18	7.5	22.5	4.5	25.5	1.5	28.5
300	**12**	4.8	7.2	3.0	9.0	1.8	10.2	0.6	11.4
600	**6**	2.4	3.6	1.5	4.5	0.9	5.1	0.3	5.7
1200	**3**	1.2	1.8	0.75	2.25	0.45	2.55	0.15	2.85
1800	**2**	0.8	1.2	0.5	1.5	0.3	1.7	0.1	1.9
3000	**1.2**	0.48	0.72	0.3	0.9	0.18	1.02	0.06	1.14

Any AC solenoid, due to its high power consumption (VA), will rapidly overheat and fail to operate, whenever its plunger is prevented from seating properly. To avoid this, a proper spring can be interposed between plunger and application. DC solenoids are not affected by this problem, as current consumed is constant all along the plunger run. When adopting a solenoid please also bear in mind what follows:

1) Any load should be always applied strictly along the plunger main axis (to avoid excessive wear due to friction, and noise magnifying due to the vibration generated by the AC power supply).

2) Any mechanical stroke-limiting device eventually provided, should be made of non magnetic material.

3) The expected life of a solenoid would be remarkably increased as much as its impact force could be absorbed by the solenoid mounting frame.

When a continuously rated (ED=100) solenoid is required but space is not enough, a ballast resistor and/or a limiting impedance could be used to feed a smaller intermittently rated solenoid (ED<100).

Prior to select the right solenoid you must always know the force required, as well as stroke, maximum feeding time, minimum OFF time, ambient temperature and supply voltage. If in doubt to select the best type for your application, please do not hesitate contacting us to help you making the right choice, supplying us with all above information. Even if you can't find the solenoid you require in our range, please let us know, as we do have both the experience and the ability to solve any problem in this field.

ORDERING IMFORMATION

PR3-TS-24AC-F100-60

1 2 3 4 5 6 7

1 - Solenoid series: PR
2 - Type (size): 1-2-3-4
3 - Action: T = Pull (standard)
TS = Push-pull
4 - Coil supply voltage: AC or DC
5 - Coil terminals:
F = Faston 0.25 (6.3x0,8mm)
(not available for PR1)
C = 150 mm leads (PR1 = 100 mm)
6 - Relative duty service ED%:
Permanently (100) or intermittently rated coils (standard values: 40-25-15-5)
7 - Coil supply frequency (if differing from 50 Hz).

NB: When ordering standard types you can omit the last group of code (7).

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Available types

PR1

Coil supply voltages :
Insulating resistance :
Dielectric strength :
Coil terminals :
Total / Plunger weight :

Axial Force (grams) Vs. Stroke and Duty Factor (ED)

ED	1	3	5	8	11	15	mm
100	230 250	100 100	50 70	- 50	- -	- -	DC AC
40	380 400	250 200	70 150	50 100	- 50	- -	DC AC
25	500 550	350 300	250 200	80 130	- 80	- -	DC AC
15	750 -	600 450	400 300	150 200	60 120	- 50	DC AC
5	1150 -	950 700	850 550	350 360	130 250	- 110	DC AC

PR2

Coil supply voltages :
Insulating resistance :
Dielectric strength :
Coil terminals :
Total / Plunger weight :

Axial Force (grams) Vs. Stroke and Duty Factor (ED)

ED	3	5	7	10	14	18	mm
100	150 150	150 100	80 60	- 50	- -	- -	DC AC
40	350 300	350 250	230 220	100 180	- 140	- 50	DC AC
25	500 450	500 400	400 350	180 300	80 200	- 100	DC AC
15	750 750	700 500	550 400	300 350	150 300	- 150	DC AC
5	1250 1250	1050 1000	950 900	700 800	350 650	- 300	DC AC

PR3

Coil supply voltages :
Insulating resistance :
Dielectric strength :
Coil terminals :
Total / Plunger weight :

Axial Force (grams) Vs. Stroke and Duty Factor (ED)

ED	3 mm	5	7	10	15	20	
100	200 250	200 170	150 140	120 120	30 100	- 50	DC AC
40	450 500	450 450	380 350	300 330	100 300	- 150	DC AC
25	600 850	600 700	500 600	400 450	150 400	- 200	DC AC
15	1150 1250	1050 950	750 850	600 650	280 600	500 350	DC AC
5	1700 2300	1500 1850	1400 1650	1150 1250	750 1100	300 700	DC AC

PR4

Coil supply voltages :
Insulating resistance :
Dielectric strength :
Coil terminals :
Total / Plunger weight :

Axial Force (grams) Vs. Stroke and Duty Factor (ED)

ED	5 mm	10	15	20	25	30	
100	1000	1000	450 240	220 220	80 200	50 200	DC
	300	260					AC
40	1600 6000	1200 5000	950 480	500 450	300 430	230 400	DC AC
25	2400 9500	2050 8000	1300 7500	750 700	500 650	350 600	DC AC
15	2800 1250	2500 9000	1950 8500	1050 8000	650 750	550 700	DC AC
5	3400 3300	3400 2600	2500 2300	1500 2100	850 2000	750 1900	DC AC

12-24-110-220-230 AC / 12-24-110 DC
> 100 MΩ @ 500V DC
1.5 KV
'flying' leads (100 mm long)
60 / 10 grams

Coil Rated Current Vs. Stroke and Duty Factor (ED)

ED	DC W	AC	Stroke (mm) 0	2	5	10	15	20
100	4,5	VA	6	8	10	11	11	
40	9	VA	13	20	23	25	27	
25	16	VA	22	32	37	40	43	
15	28	VA	38	51	57	63	67	
5	70	VA	105	130	142	158	175	

12-24-110-220-230 AC / 12-24-110 DC
> 100 MΩ @ 500V DC
1.5 KV
Faston 6.3x0.8 mm or leads (150 mm)
100 / 15 grams

Coil Rated Current Vs. Stroke and Duty Factor (ED)

ED	DC W	AC	Stroke (mm) 0	2	5	10	15	20
100	6	VA	8	12	14	16	18	19
40	13	VA	17	25	33	37	41	44
25	22	VA	27	40	49	60	65	69
15	36	VA	50	70	82	94	104	110
5	75	VA	150	212	230	258	280	295

12-24-110-220-230 AC / 12-24-110 DC
> 100 MΩ @ 500V DC
1.5 KV
Faston 6.3x0.8 mm or leads (150 mm)
170 / 20 grams

Coil Rated Current Vs. Stroke and Duty Factor (ED)

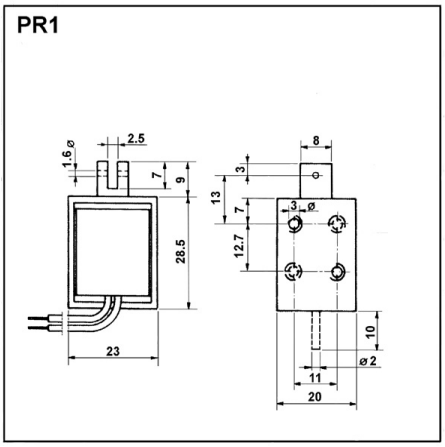
ED	DC W	AC	Stroke (mm) 0	2	5	10	15	20
100	9	VA	10	15	19	25	30	33
40	20	VA	22	31	43	58	67	73
25	30	VA	33	49	65	85	101	112
15	50	VA	60	85	114	148	175	192
5	13	VA	16	22	27	39	46	50
	0		0	0	5	0	0	5

12-24-110-220-230 AC / 12-24-110 DC
> 100 MΩ @ 500V DC
1.5 KV
Faston 6.3x0.8 mm or leads (150 mm)
500 / 70 grams

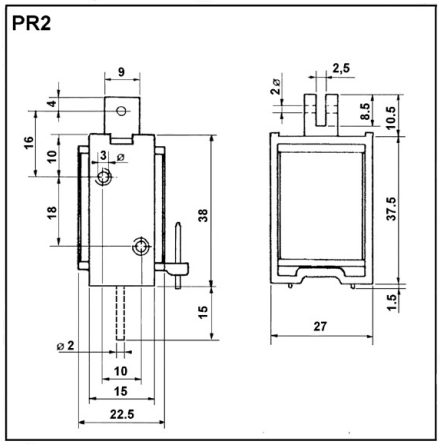
Coil Rated Current Vs. Stroke and Duty Factor (ED)

ED	DC W	AC	Stroke (mm) 0	10	15	20	25	30
100	11	VA	14	40	55	65	75	80
40	26	VA	40	110	135	160	190	210
25	42	VA	60	155	190	230	275	295
15	70	VA	110	210	260	300	350	400
5	190	VA	315	450	510	570	630	480

PR1



PR2



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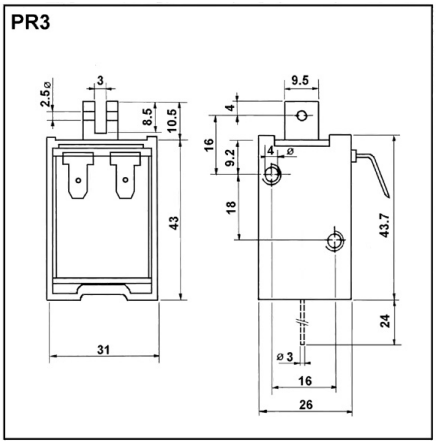
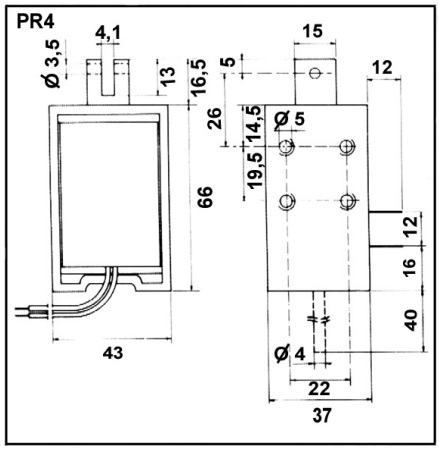
PR3



PR4



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