

D.C. miniature gear-motors

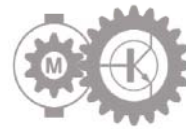


micro  
motors s.r.l.



t e c h n o l o g y i n m o t i o n





D.C. miniature gear-motors



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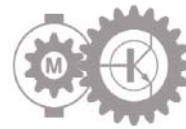
gear-motors with two-phase Hall-effect 90° encoder



gear-motors with Hall-effect encoder

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## general guide

## gear-motors



TYPE		1271	B138F BS138F	B138F.4/12 BS138F.4/12	HL149	HV155	1308	E192	P205
Voltage	V	4-6-12	6-12	12	12-24	12-24	12-24	12-24	12-24
Reduction		10 ÷ 392	12 ÷ 1470	12 ÷ 608	10 ÷ 90	10 ÷ 90	30 ÷ 630	3 ÷ 625	4 ÷ 625
Max Torque	Ncm	20	50	50	15	25	100	300	900
Speed (no load)	RPM	255 ÷ 6	220 ÷ 1.8	320 ÷ 6.5	315 ÷ 37	660 ÷ 75	110 ÷ 5	1100 ÷ 6.4	1024 ÷ 6.7
Speed (max Torque)	RPM	165 ÷ 4	155 ÷ 1.6	250 ÷ 5.3	220 ÷ 30	460 ÷ 62	70 ÷ 4.5	770 ÷ 6	640 ÷ 6.3
Dimensions	mm	Ø 27	Ø 34	Ø 34	Ø 30	Ø 30	Ø 39.6	Ø 40.5	42 x 42

**NOTE:**

It is recommended to avoid the use of the motor's internal inductance in PWM drive applications. It is advisable to use an external series inductance.



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planetary

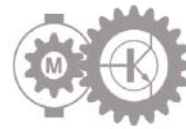


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TECHNICAL DATA

series

**1271**

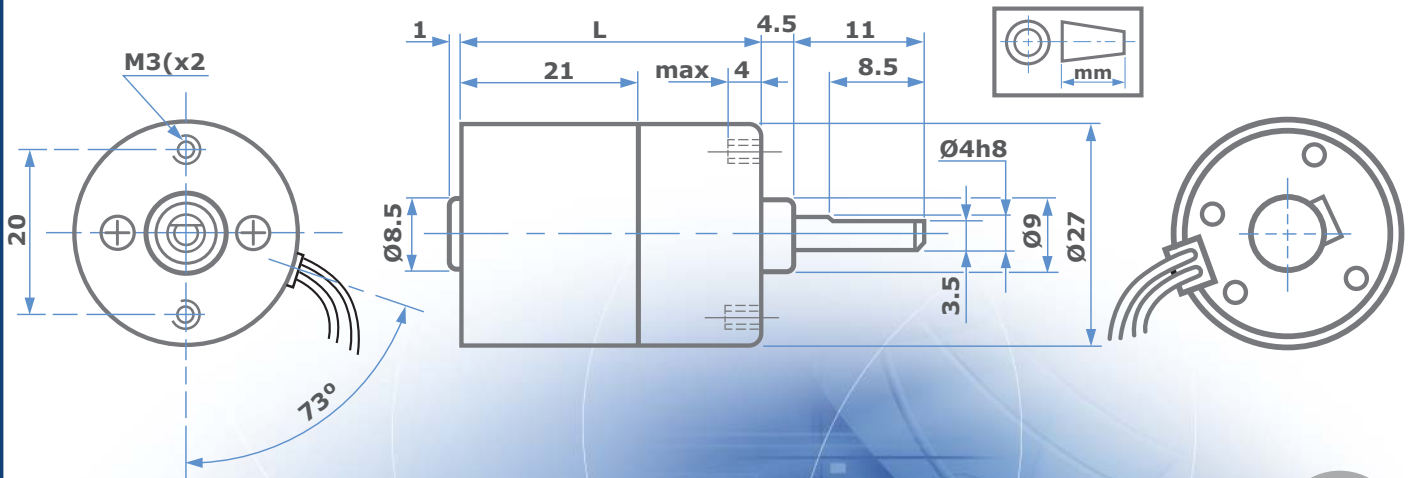
- VDR interference suppression on the collector
- Precious metal brushes (Au - Ag - Cu)
- Direction of rotation depending on polarity
- Can be mounted in any position
- Maximum radial shaft load: 10N
- Maximum axial shaft load: 5N
- Temperature range: -20°C/60°C
- Approx weight: 55g

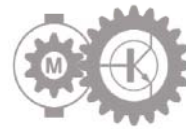


Typical values at ambient temperature +20°  
Tolerance +/- 10%

TYPE	NOMINAL VOLTAGE	L	RATIO TO:1	MAXIMUM TORQUE	SPEED		CURRENT	
					NO LOAD	AT MAX TORQUE	NO LOAD	AT MAX TORQUE
					rpm		mA	
1271· 6 ·10	4.5	36	10	1.5	255	165	<35	100
	6				215	120	<30	85
	12				255	165	<20	50
1271· 6 ·21	4.5	36	20.8	2.5	125	80	<35	100
	6				105	60	<30	85
	12				125	80	<20	50
1271· 6 ·43	4.5	41	43.3	3.8	60	40	<35	100
	6				52	32	<30	85
	12				60	40	<20	50
1271· 6 ·90	4.5	41	90.3	8	30	18	<35	100
	6				25	13	<30	85
	12				30	18	<20	50
1271· 6 ·188	4.5	46	188	14	14	9	<35	100
	6				12	7	<30	85
	12				14	9	<20	50
1271· 6 ·392	4.5	46	391.8	20	7	5	<35	90
	6				6	4	<30	75
	12				7	5	<20	45

1271





TECHNICAL DATA

series

**B138F**



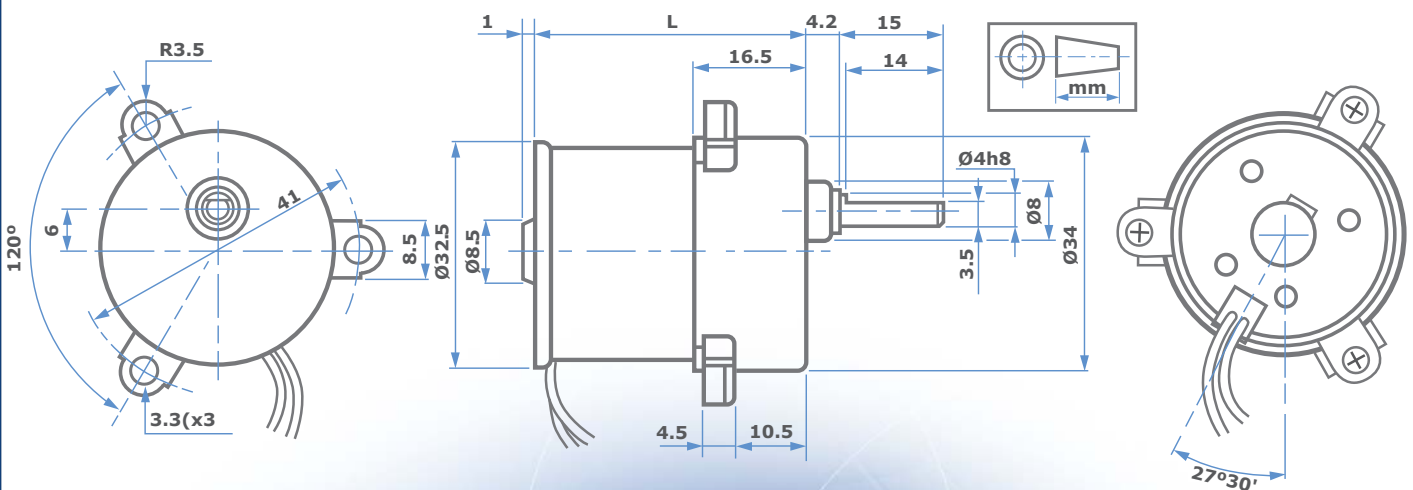
VDR interference suppression on the collector  
 Precious metal brushes (Au - Ag - Cu)  
 Direction of rotation depending on polarity  
 Can be mounted in any position  
 Maximum radial shaft load: 20N  
 Maximum axial shaft load: 5N  
 Temperature range: -20°C/60°C  
 Approx weight: 85g



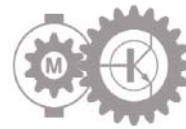
Typical values at ambient temperature +20°  
 Tolerance +/- 10%

TYPE	NOMINAL VOLTAGE	L	RATIO TO:1	MAXIMUM TORQUE	SPEED		CURRENT	
					NO LOAD	AT MAX TORQUE	NO LOAD	AT MAX TORQUE
					v	mm	Ncm	rpm
B138F. $\frac{6}{12}$ .12	$\frac{6}{12}$	37.5	12.25	1.5	220	155	<30 <20	100 55
B138F. $\frac{6}{12}$ .21	$\frac{6}{12}$	37.5	21.14	2.5	125	85	<30 <20	100 55
B138F. $\frac{6}{12}$ .36	$\frac{6}{12}$	37.5	35.73	4	73	53	<30 <20	95 50
B138F. $\frac{6}{12}$ .72	$\frac{6}{12}$	37.5	71.54	7	37	28	<30 <20	95 50
B138F. $\frac{6}{12}$ .149	$\frac{6}{12}$	37.5	149.05	14	18	13	<30 <20	95 50
B138F. $\frac{6}{12}$ .208	$\frac{6}{12}$	37.5	208.66	20	13	9	<30 <20	95 50
B138F. $\frac{6}{12}$ .608	$\frac{6}{12}$	37.5	608.61	50	4.3	3.3	<30 <20	90 48
B138F. $\frac{6}{12}$ .1470	$\frac{6}{12}$	37.5	1470.82	50	1.8	1.6	<30 <20	58 30

B138F



**B138F**



TECHNICAL DATA

series

**B138F.4/12**

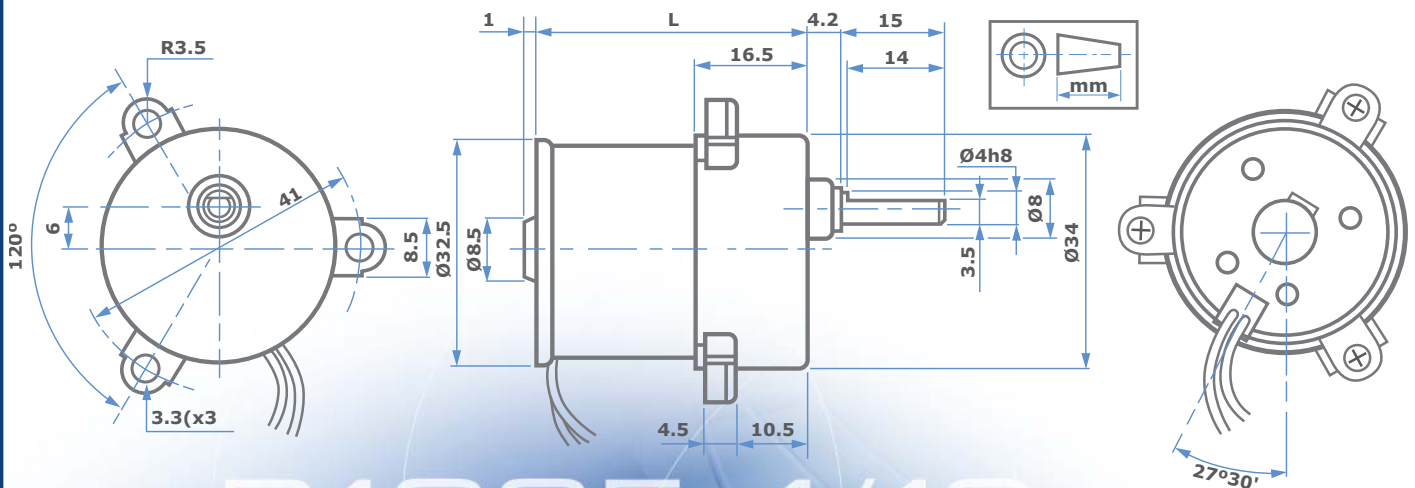
- VDR interference suppression on the collector
- Precious metal brushes (Au - Ag - Cu)
- Direction of rotation depending on polarity
- Can be mounted in any position
- Maximum radial shaft load: 20N
- Maximum axial shaft load: 5N
- Temperature range: -20°C/60°C
- Approx weight: 85g



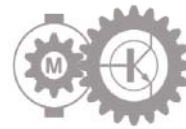
Typical values at ambient temperature +20°  
Tolerance +/- 10%

TYPE	NOMINAL VOLTAGE	L	RATIO TO:1	MAXIMUM TORQUE	SPEED		CURRENT	
					NO LOAD	AT MAX TORQUE	NO LOAD	AT MAX TORQUE
					rpm		mA	
	v	mm		Ncm				
B138F - 4/12 - 12	12	37.5	12.25	1.5	320	250	<30	80
B138F - 4/12 - 21	12	37.5	21.14	2.5	190	150	<30	80
B138F - 4/12 - 36	12	37.5	35.73	4.2	108	86	<30	80
B138F - 4/12 - 72	12	37.5	71.54	8.2	54	43	<30	80
B138F - 4/12 - 149	12	37.5	149.05	15	27	20	<30	80
B138F - 4/12 - 208	12	37.5	208.66	20	19	14	<30	80
B138F - 4/12 - 608	12	37.5	608.61	50	6.5	5.3	<30	75

B138F.4/12



**B138F.4/12**



## TECHNICAL DATA

series

# BS138F



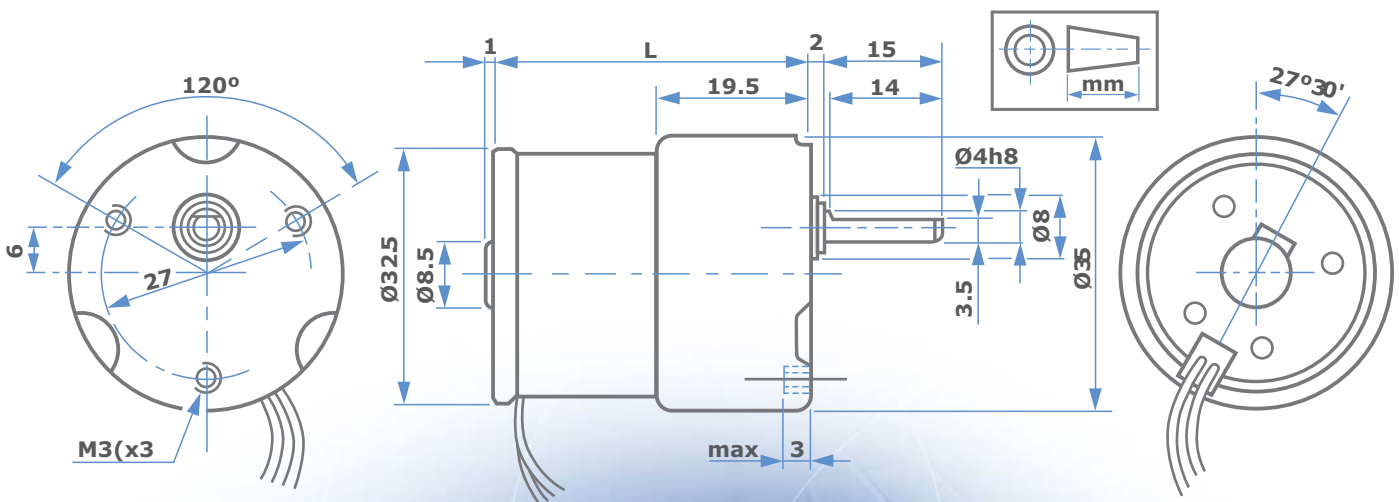
VDR interference suppression on the collector  
 Precious metal brushes (Au - Ag - Cu)  
 Direction of rotation depending on polarity  
 Can be mounted in any position  
 Maximum radial shaft load: 20N  
 Maximum axial shaft load: 5N  
 Temperature range: -20°C/60°C  
 Approx weight: 90g



Typical values at ambient temperature +20°  
 Tolerance +/- 10%

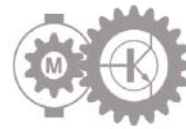
TYPE	NOMINAL VOLTAGE	L mm	RATIO TO:1	MAXIMUM TORQUE Ncm	SPEED		CURRENT	
					NO LOAD	AT MAX TORQUE	NO LOAD	AT MAX TORQUE
					rpm		mA	
BS138F- $\frac{6}{12}$ ·12	$\frac{6}{12}$	40	12.25	1.5	220	155	<30 <20	100 55
BS138F- $\frac{6}{12}$ ·21	$\frac{6}{12}$	40	21.14	2.5	125	85	<30 <20	100 55
BS138F- $\frac{6}{12}$ ·36	$\frac{6}{12}$	40	35.73	4	73	53	<30 <20	95 50
BS138F- $\frac{6}{12}$ ·72	$\frac{6}{12}$	40	71.54	7	37	28	<30 <20	95 50
BS138F- $\frac{6}{12}$ ·149	$\frac{6}{12}$	40	149.05	14	18	13	<30 <20	95 50
BS138F- $\frac{6}{12}$ ·208	$\frac{6}{12}$	40	208.66	20	13	9	<30 <20	95 50
BS138F- $\frac{6}{12}$ ·608	$\frac{6}{12}$	40	608.61	50	4.3	3.3	<30 <20	90 48
BS138F- $\frac{6}{12}$ ·1470	$\frac{6}{12}$	40	1470.82	50	1.8	1.6	<30 <20	58 30

# BS138F



# BS138F





TECHNICAL DATA

series

BS138F.4/12

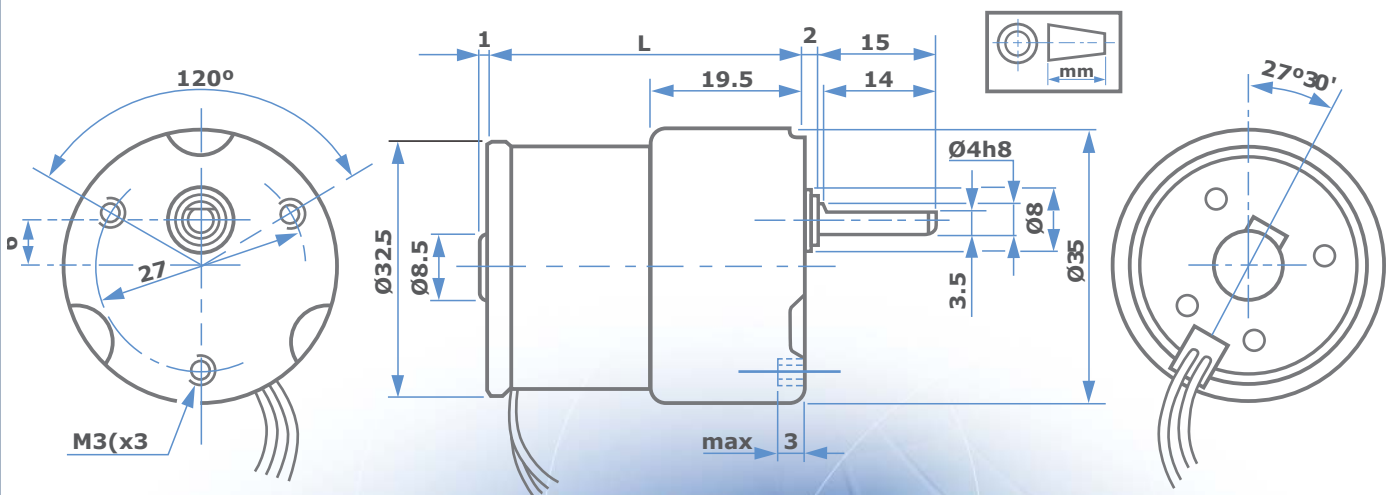
- VDR interference suppression on the collector
- Precious metal brushes (Au - Ag - Cu)
- Direction of rotation depending on polarity
- Can be mounted in any position
- Maximum radial shaft load: 20N
- Maximum axial shaft load: 5N
- Temperature range: -20°C/60°C
- Approx weight: 90g



Typical values at ambient temperature +20°  
Tolerance +/- 10%

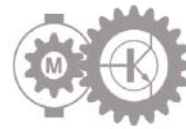
TYPE	NOMINAL VOLTAGE	L	RATIO TO:1	MAXIMUM TORQUE	SPEED		CURRENT	
					NO LOAD	AT MAX TORQUE	NO LOAD	AT MAX TORQUE
					v	mm	Ncm	rpm
BS138F - 4/12 - 12	12	40	12.25	1.5	320	250	<30	80
BS138F - 4/12 - 21	12	40	21.14	2.5	190	150	<30	80
BS138F - 4/12 - 36	12	40	35.73	4.2	108	86	<30	80
BS138F - 4/12 - 72	12	40	71.54	8.2	54	43	<30	80
BS138F - 4/12 - 149	12	40	149.05	15	27	20	<30	80
BS138F - 4/12 - 208	12	40	208.66	20	19	14	<30	80
BS138F - 4/12 - 608	12	40	608.61	50	6.5	5.3	<30	75

BS138F.4/12



BS138F.4/12





TECHNICAL DATA

series

**HL149**

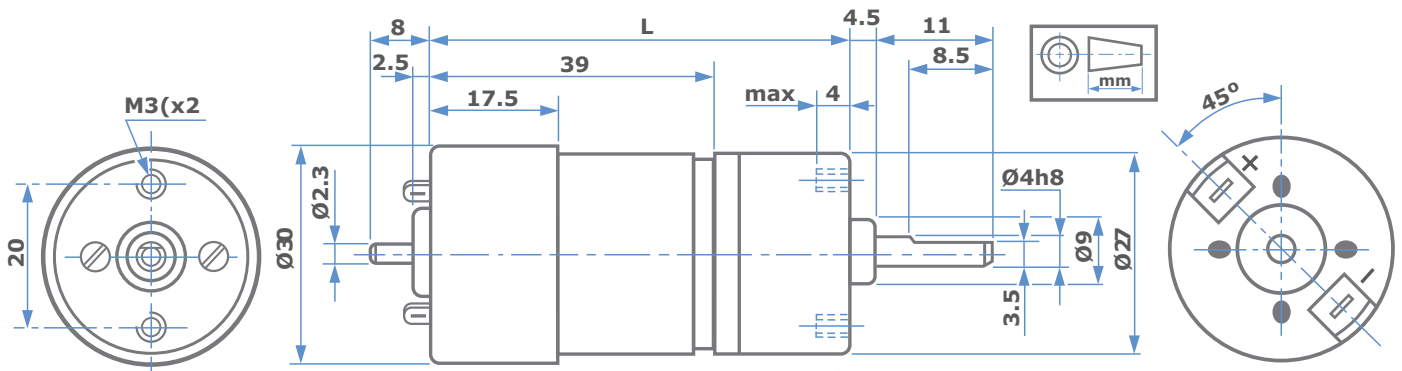
- VDR interference suppression on the collector
- Direction of rotation depending on polarity
- Can be mounted in any position
- Maximum radial shaft load: 10N
- Maximum axial shaft load: 5N
- Temperature range: -20°C/60°C
- Approx weight: 100g



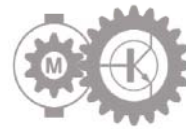
Typical values at ambient temperature +20°  
Tolerance +/- 10%

TYPE	NOMINAL VOLTAGE	L	RATIO TO:1	MAXIMUM TORQUE	SPEED		CURRENT	
					NO LOAD	AT MAX TORQUE	NO LOAD	AT MAX TORQUE
					rpm		mA	
HL149- $\frac{12}{24}$ -10	$\frac{12}{24}$	57.5	10	4	315	220	<60 <50	210 120
HL149- $\frac{12}{24}$ -21	$\frac{12}{24}$	57.5	20.8	7.5	160	115	<60 <50	200 115
HL149- $\frac{12}{24}$ -43	$\frac{12}{24}$	62.5	43.3	15	78	55	<60 <50	210 120
HL149- $\frac{12}{24}$ -90	$\frac{12}{24}$	62.5	90.3	15	37	30	<60 <50	150 85

**HL149**



**HL149**



TECHNICAL DATA

series

**HV155**



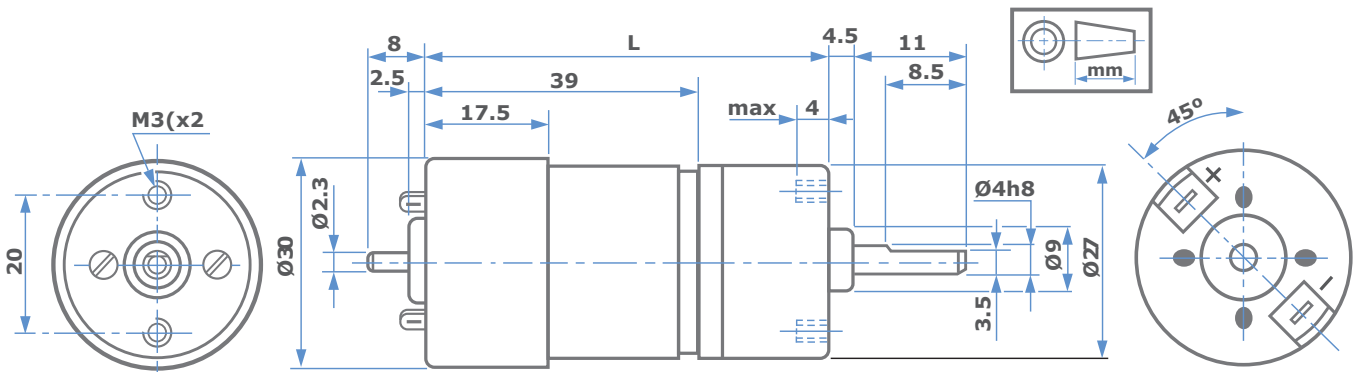
- VDR interference suppression on the collector
- Direction of rotation depending on polarity
- Can be mounted in any position
- Maximum radial shaft load: 10N
- Maximum axial shaft load: 5N
- Temperature range: -20°C/60°C
- Approx weight: 100g



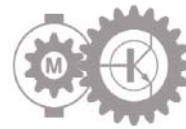
Typical values at ambient temperature +20°  
Tolerance +/- 10%

TYPE	NOMINAL VOLTAGE	L	RATIO TO:1	MAXIMUM TORQUE	SPEED		CURRENT	
					NO LOAD	AT MAX TORQUE	NO LOAD	AT MAX TORQUE
					rpm		mA	
HV155· $\frac{12}{24}$ ·10	$\frac{12}{24}$	62.5	10	5	660	460	<140 <70	620 300
HV155· $\frac{12}{24}$ ·21	$\frac{12}{24}$	62.5	20.8	10	315	235	<140 <70	600 285
HV155· $\frac{12}{24}$ ·43	$\frac{12}{24}$	67.5	43.3	18	155	115	<140 <70	580 280
HV155· $\frac{12}{24}$ ·90	$\frac{12}{24}$	67.5	90.3	25	75	62	<140 <70	440 215

HV155



**HV155**



## TECHNICAL DATA

series

# 1308



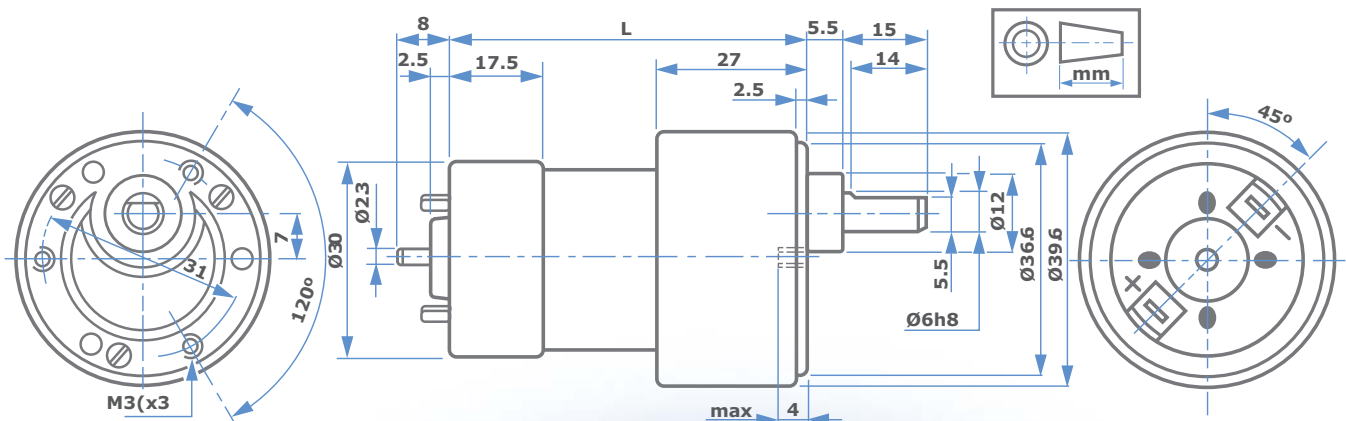
VDR interference suppression on the collector  
 Direction of rotation depending on polarity  
 Can be mounted in any position  
 Maximum radial shaft load: 50N  
 Maximum axial shaft load: 10N  
 Temperature range: -20°C/60°C  
 Approx weight: 190g



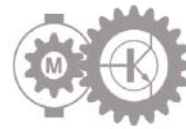
Typical values at ambient temperature +20°  
 Tolerance +/- 10%

TYPE	NOMINAL VOLTAGE	L	RATIO TO:1	MAXIMUM TORQUE	SPEED		CURRENT	
					NO LOAD	AT MAX TORQUE	NO LOAD	AT MAX TORQUE
					rpm		mA	
1308 · 12/24 · 30	12/24	64	29.75	15	110	70	<60 <50	250 130
1308 · 12/24 · 75	12/24	66.5	76.84	30	43	28	<60 <50	230 120
1308 · 12/24 · 100	12/24	66.5	94.37	40	35	22	<60 <50	240 125
1308 · 12/24 · 200	12/24	69	198.5	80	17	10	<60 <50	250 130
1308 · 12/24 · 250	12/24	69	243.8	100	14	8.5	<60 <50	240 125
1308 · 12/24 · 510	12/24	72	512.85	100	6.5	5	<60 <50	150 80
1308 · 12/24 · 630	12/24	72	629.82	100	5	4.5	<60 <50	130 70

# 1308







## TECHNICAL DATA

series

# E192



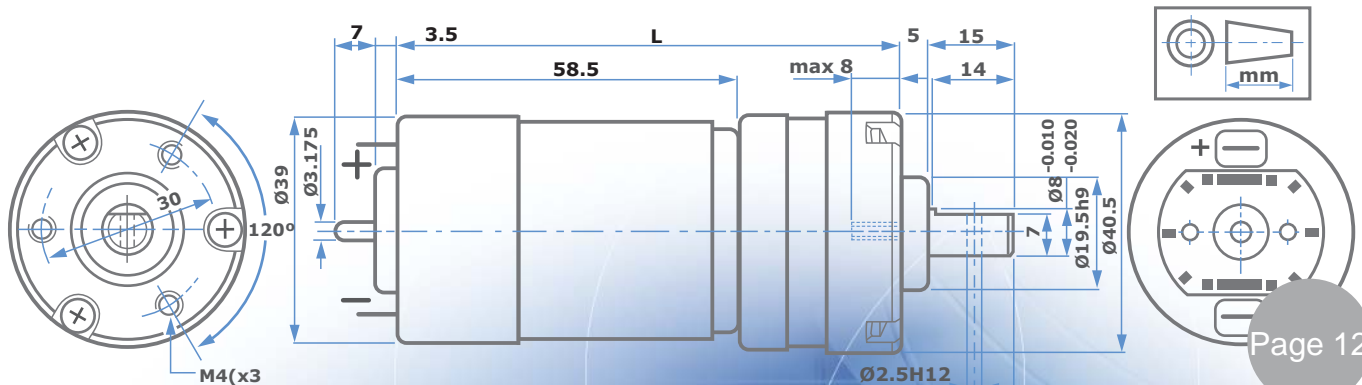
Planetary gear-motor  
 Motor interference suppression by VDR and capacitors  
 Outgoing shaft two ball bearings supported  
 Maximum radial shaft load: 200N  
 (10 mm from the fixing flange)  
 Maximum axial shaft load: 100N  
 Direction of rotation depending on polarity  
 Can be mounted in any position  
 Temperature working range: -20°C/60°C  
 Approx weight: 385/480g



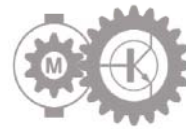
Typical values at ambient temperature +20°  
 Tolerance +/- 10%

TYPE	NOMINAL VOLTAGE	L	RATIO TO:1	MAXIMUM TORQUE	SPEED		CURRENT		INPUT POWER AT MAX TORQUE
					NO LOAD	AT MAX TORQUE	NO LOAD	AT MAX TORQUE	
					rpm	A	W		
E192-12/24-3	12/24	86	3.66	15	1100/1100	700/770	<0.4/<0.2	1.70/0.96	20.4/23
E192-12/24-5	12/24	86	5	20	800/830	510/575	<0.4/<0.2	1.75/0.95	21/22.8
E192-12/24-13	12/24	93	13.44	45	300/300	200/225	<0.4/<0.2	1.65/0.85	19.8/20.4
E192-12/24-18	12/24	93	18.33	60	218/226	155/170	<0.4/<0.2	1.65/0.84	19.8/20.2
E192-12/24-25	12/24	93	25	90	160/166	105/118	<0.4/<0.2	1.75/0.88	21/21.1
E192-12/24-49	12/24	100	49.29	160	82/82	58/60	<0.4/<0.2	1.60/0.85	19.2/20.4
E192-12/24-67	12/24	100	67.22	220	59.5/61.5	40/45	<0.4/<0.2	1.80/0.88	21.6/21.1
E192-12/24-91	12/24	100	91.66	270	43.6/45	31/34	<0.4/<0.2	1.70/0.85	20.4/20.4
E192-12/24-125	12/24	100	125	300	32/33	24/26	<0.4/<0.2	1.32/0.64	15.9/15.4
E192-12/24-180	12/24	107	180.75	220	22/22	20/20	<0.4/<0.2	0.75/0.42	9/10.1
E192-12/24-246	12/24	107	246.48	300	15.2/16.8	14.5/15	<0.4/<0.2	0.87/0.43	10.5/10.3
E192-12/24-336	12/24	107	336.11	300	11.9/12.3	11/11.5	<0.4/<0.2	0.69/0.34	8.3/8.2
E192-12/24-458	12/24	107	458.3	300	9/9.5	8.5/9	<0.4/<0.2	0.54/0.28	6.5/6.7
E192-12/24-625	12/24	107	625	300	6.4/6.6	6/6.2	<0.4/<0.2	0.46/0.23	5.5/5.5

# E192



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## TECHNICAL DATA

series

# P205

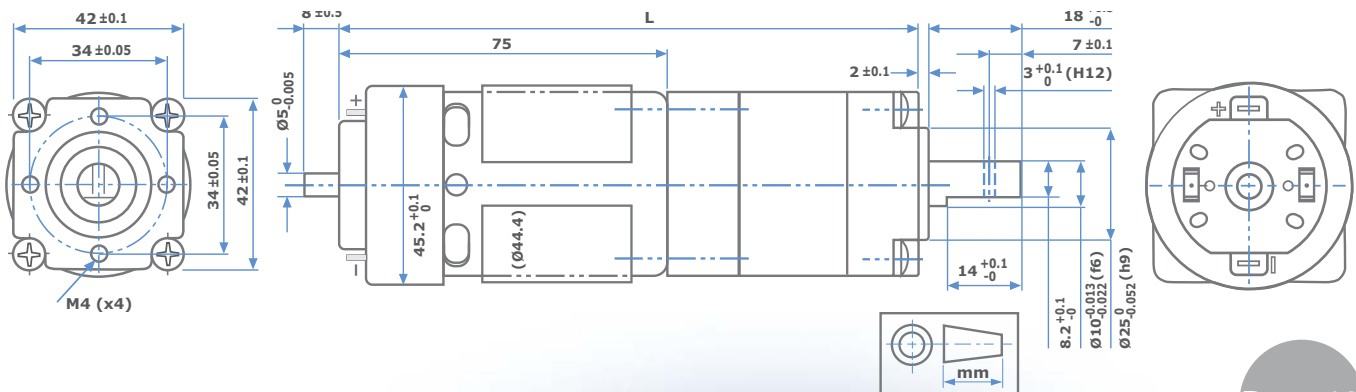


Planetary gear-motor  
 Motor interference suppression by VDR  
 Outgoing shaft supported by two ball bearings  
 Maximum radial shaft load: 300N  
 (10 mm from the fixing flange)  
 Maximum axial shaft load: 150N  
 Direction of rotation depending on polarity  
 Can be mounted in any position  
 Working temperature range: -20°C/60°C  
 Approx weight: 700/900g

Typical values at ambient temperature +20°  
 Tolerance +/- 10%

TYPE	NOMINAL VOLTAGE	L	RATIO TO:1	MAXIMUM TORQUE	SPEED		CURRENT		INPUT POWER AT MAX TORQUE
					NO LOAD	AT MAX TORQUE	NO LOAD	AT MAX TORQUE	
					rpm	A	W		
P205-12/24-4	12/24	120.5	4	50	1024/1017	625/640	<0.7/<0.4	5.45/2.70	65.4/64.8
P205-12/24-6	12/24	120.5	6.25	60	656/652	459/470	<0.7/<0.4	4.20/2.15	50.4/51.6
P205-12/24-16	12/24	133	16	150	257/256	178/186	<0.7/<0.4	4.50/2.20	54.0/52.8
P205-12/24-25	12/24	133	25	250	165/165	110/116	<0.7/<0.4	4.55/2.30	54.6/55.2
P205-12/24-39	12/24	133	39.06	350	106/105	75/77	<0.7/<0.4	4.20/2.10	50.4/50.4
P205-12/24-64	12/24	145.5	64	600	64/64	41.5/45	<0.7/<0.4	4.80/2.40	57.6/57.6
P205-12/24-100	12/24	145.5	100	700	41.3/41.3	30.3/32.4	<0.7/<0.4	3.60/1.75	43.2/42.0
P205-12/24-156	12/24	145.5	156.25	800	26.5/26.5	21.3/22	<0.7/<0.4	2.85/1.45	34.2/34.8
P205-12/24-244	12/24	145.5	244.14	900	16.9/16.9	14.9/14.9	<0.7/<0.4	2.20/1.10	26.4/26.4
P205-12/24-400	12/24	158	400	900	10.2/10.2	9.4/9.4	<0.7/<0.4	1.65/0.85	19.8/20.4
P205-12/24-625	12/24	158	625	900	6.7/6.7	6.3/6.3	<0.7/<0.4	1.25/0.65	15.0/15.6

P205



# optional encoders

gear-motors with two-phase  
Hall-effect 90° encoder

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gear-motors with Hall-effect  
encoder

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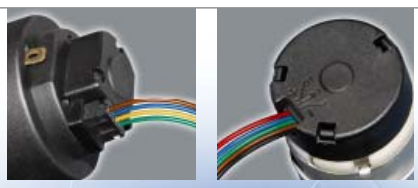
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micro  
motors s.r.l.

technology in motion

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## gear-motors with two-phase Hall-effect 90° encoder

### SIX POLES MAGNET:

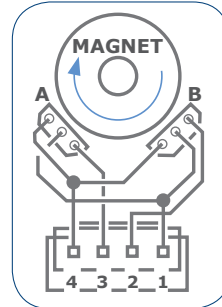
#### THREE PULSES FOR MOTOR TURN

The sequence of the phases A-B is obtained connecting the motor with the polarities printed on the black bottom cover.

### HALL-EFFECT SWITCHES

These Hall-effect switches are highly temperature stable and stress-resistant sensors best utilized in applications that provide steep magnetic slopes and low residual levels of magnetic flux density. Each device includes a voltage regulator, quadratic Hall voltage generator, temperature stability circuit, signal Schmitt chopper stabilized amplifier, Schmitt trigger and an open drain mosfet on a single silicon chip.

The on-board regulator permits operation with supply voltages of 3.5 to 24V. The output mosfet can sink up to 20 mA with suitable output pull up. they can be used directly with bipolar or MOS logic circuits.



#### connections

- 1 Green: GROUND
- 2 Yellow: O.C. B NPN
- 3 Blue: O.C. A NPN
- 4 Brown: Vcc (Hall)



### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Supply Voltage	VDD	28	V
Supply Current	IDD	50	mA
Output Voltage	VOUT	28	V
Output Current	IOUT	50	mA
Storage Temperature Range	TS	-50 to 150	°C
Maximum Junction Temperature	TJ	165	°C

Exceeding the absolute maximum ratings may cause permanent damage. Exposure to all absolute-maximum-rated conditions for extended periods may affect device reliability.



### GENERAL ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYPE	MAX	UNITS
Supply Voltage	VDD	Operating	3.5	-	24	V
Supply Current	IDD	B<BRP	-	-	5	mA
Output Saturation Voltage	VDSon	IOUT=20mA, B>BOP	-	-	0.5	V
Output Leakage Current	IOFF	IB<BRP, VOUT=24V	-	0.3	10	µA
Output Rise Time	tr	RL=1kΩ, CL=20pF	-	0.25	-	µs
Output Fall Time	tr	RL=1kΩ, CL=20pF	-	0.25	-	µs

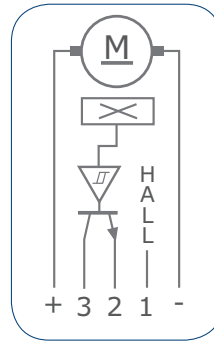
OC Operating Parameters TA = 25 °C, VDD = 3.5V to 24V (unless otherwise specified)

## gear-motors with Hall-effect encoder

SIX POLES MAGNET:  
THREE PULSES FOR MOTOR TURN

### HALL-EFFECT SWITCHES

Hall-effect switches are highly temperature stable and stress-resistant sensors best utilized in applications that provide steep magnetic slopes and low residual levels of magnetic flux density. Each device includes a voltage regulator, quadratic Hall voltage generator, temperature stability circuit, signal chopper stabilized amplifier, Schmitt trigger and an open drain mosfet on a single silicon chip. The on-board regulator permits operation with supply voltages of 3.5 to 24V. The output mosfet can sink up to 20 mA with suitable output pull up. they can be used directly with bipolar or MOS logic circuits.



#### connections

+ Red	: +Motor
3 Blue	: O.C. Output
2 Green	: Ground
1 Brown	: Vcc (Hall)
- Black	: -Motor



### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Supply Voltage	VDD	28	V
Supply Current	IDD	50	mA
Output Voltage	VOUT	28	V
Output Current	IOUT	50	mA
Storage Temperature Range	TS	-50 to 150	°C
Maximum Junction Temperature	TJ	2.0	°C

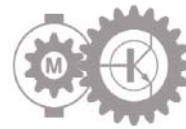
Exceeding the absolute maximum ratings may cause permanent damage. Exposure to all absolute-maximum-rated conditions for extended periods may affect device reliability.



### GENERAL ELECTRICAL SPECIFICATIONS

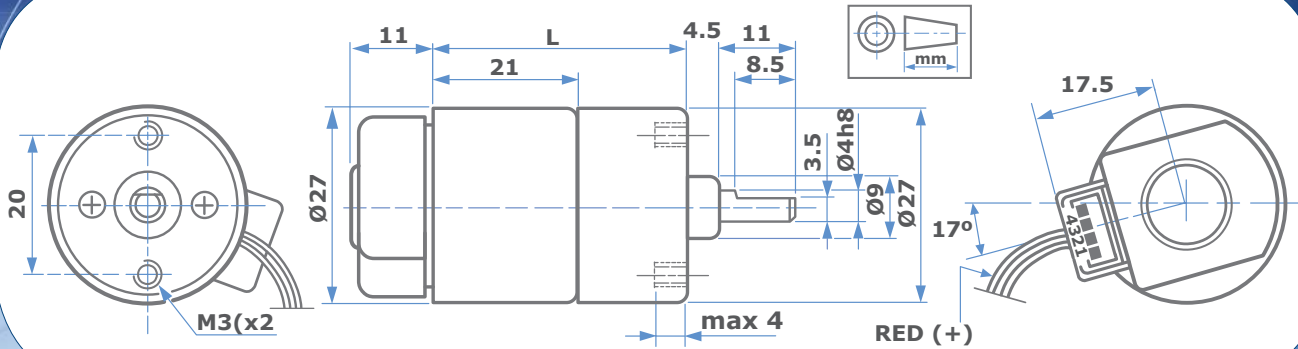
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYPE	MAX	UNITS
Supply Voltage	VDD	Operating	3.5	-	24	V
Supply Current	IDD	B<BRP	-	-	5	mA
Output Saturation Voltage	VDSon	IOUT=20mA. B>BOP	-	-	0.5	V
Output Leakage Current	IOFF	IB<BRP. VOUT=24V	-	0.3	10	µA
Output Rise Time	tr	RL=1kΩ. CL=20pF	-	0.25	-	µs
Output Fall Time	tr	RL=1kΩ. CL=20pF	-	0.25	-	µs

OC Operating Parameters TA = 25 °C, VDD = 3.5V to 24V (unless otherwise specified)



gear-motors with two-phase Hall-effect 90° encoder

## 1271-2S

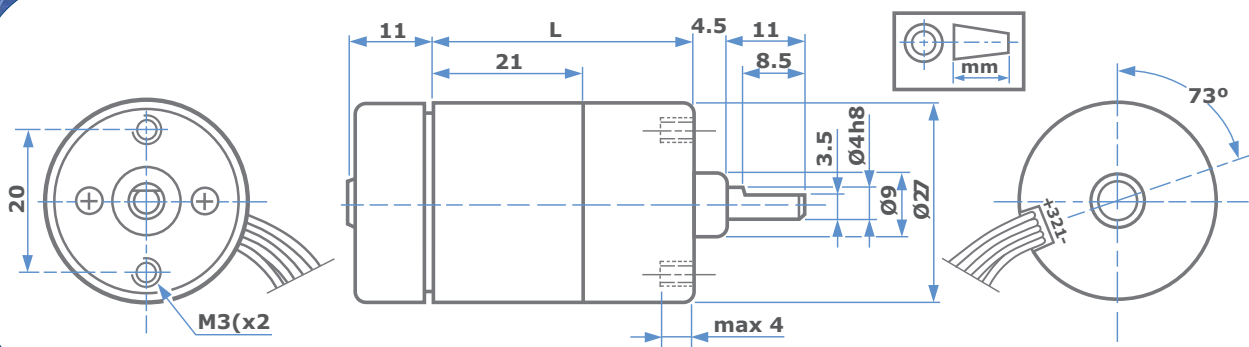


L = See: Series 1271



gear-motors with Hall-effect encoder

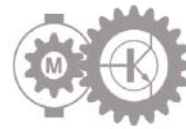
## 1271-E



L = See: Series 1271

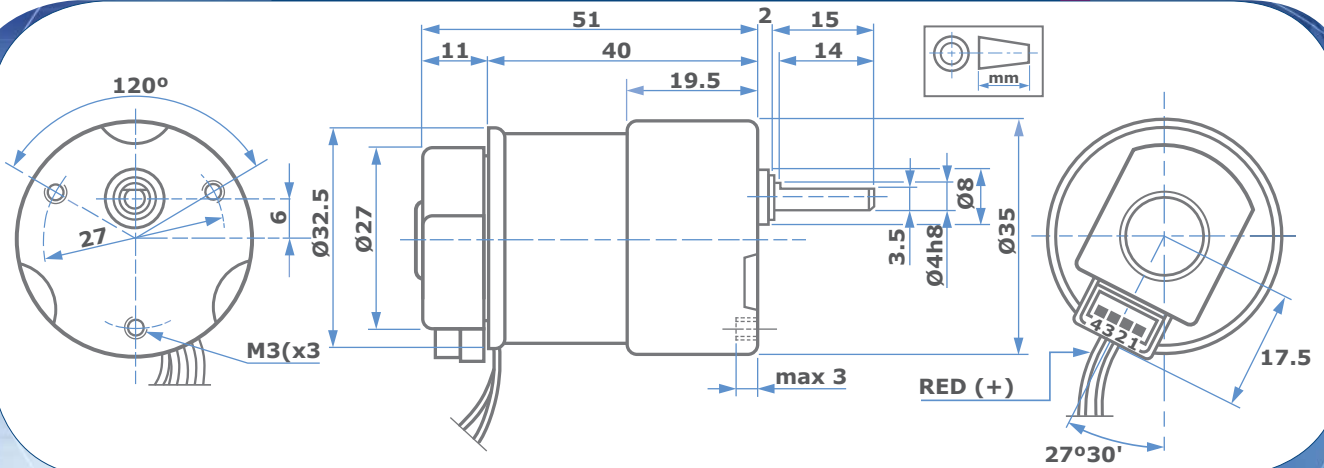






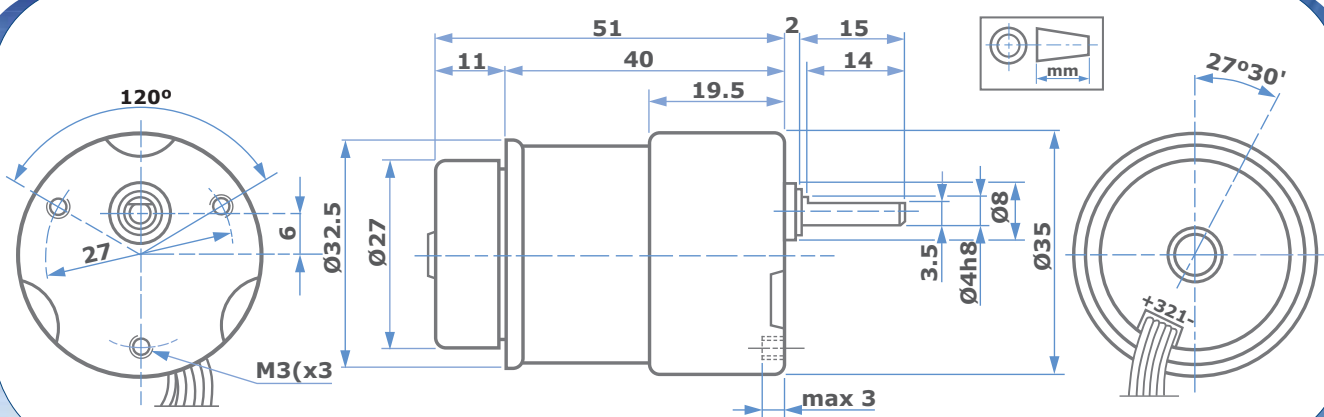
gear-motors with two-phase Hall-effect 90° encoder

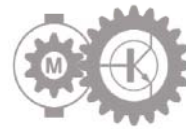
### BS138F-2S



gear-motors with Hall-effect encoder

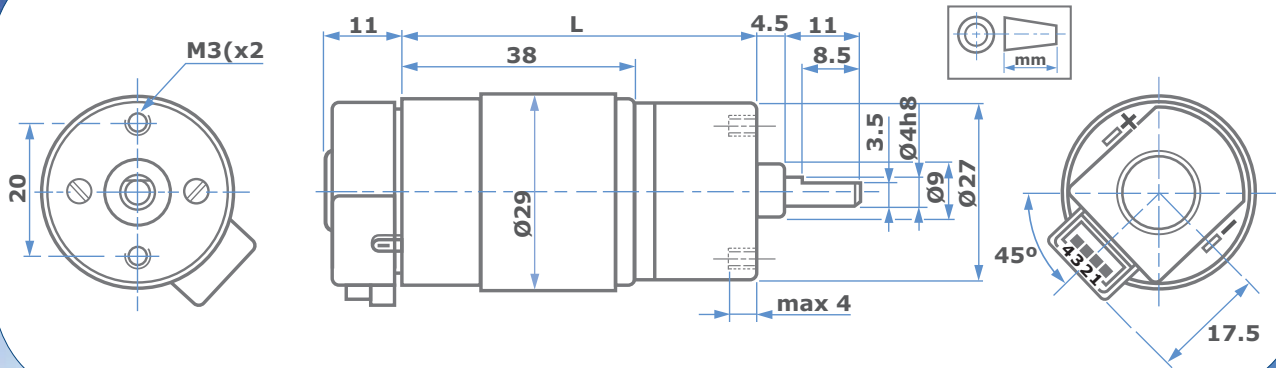
### BSE138F





gear-motors with two-phase Hall-effect 90° encoder

### HL149-2S/HV155-2S

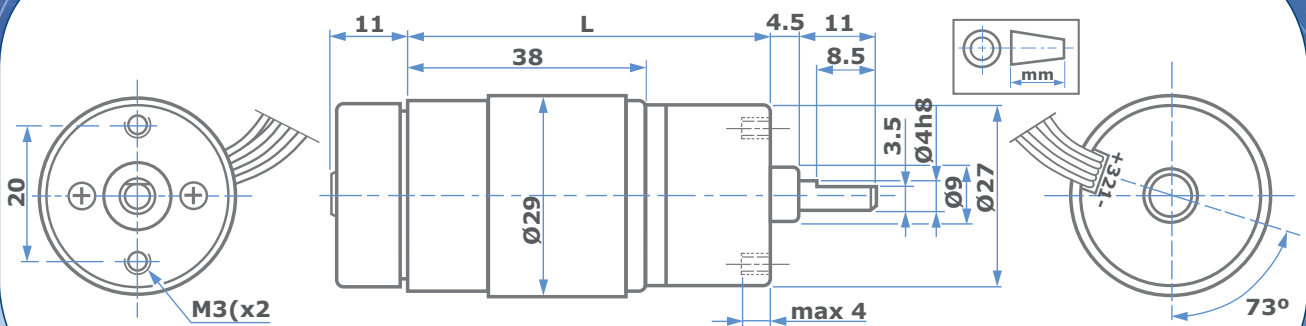


L = See: Series HL149 - HV155



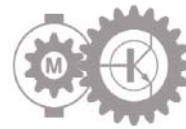
gear-motors with Hall-effect encoder

### HLE149/HVE155



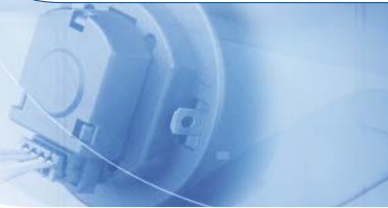
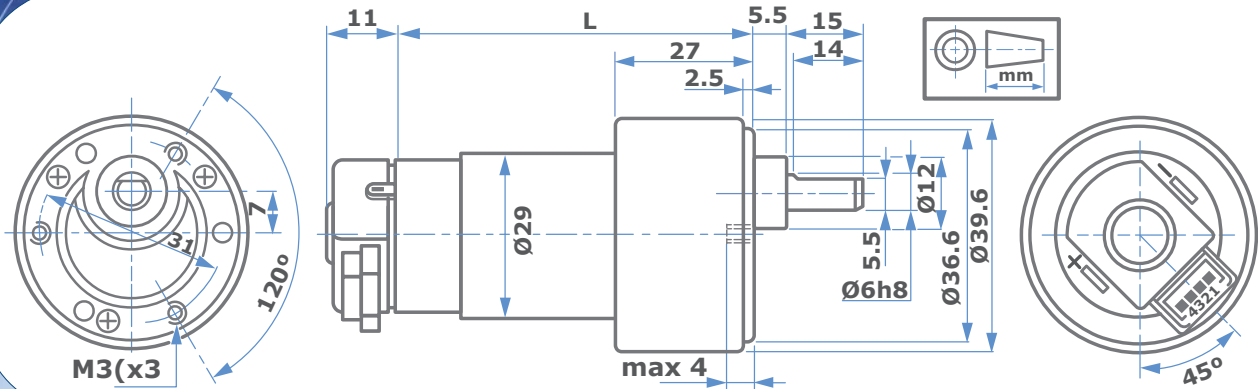
L = See: Series HL149 - HV155





gear-motors with two-phase Hall-effect 90° encoder

### 1308-2S

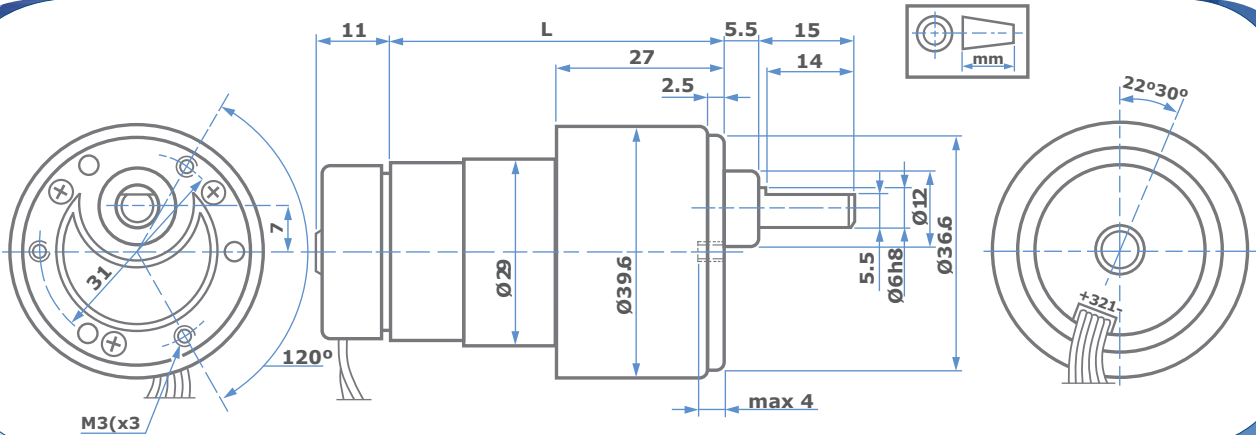


L = See: Series - 1308



gear-motors with Hall-effect encoder

### 1308E



L = See: Series - 1308





