D.C. miniature gear-motors

micro motors s.r.l.

technology in motion

D.C. miniature gear-motors

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motor

encoder

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

gear-motors with Hall-effect encoder

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technology in motion

Email:sales@mclennan.co.uk www.mclennan.co.uk Tel:+44 (0) 8707 700700

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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TECHNICAL DATA

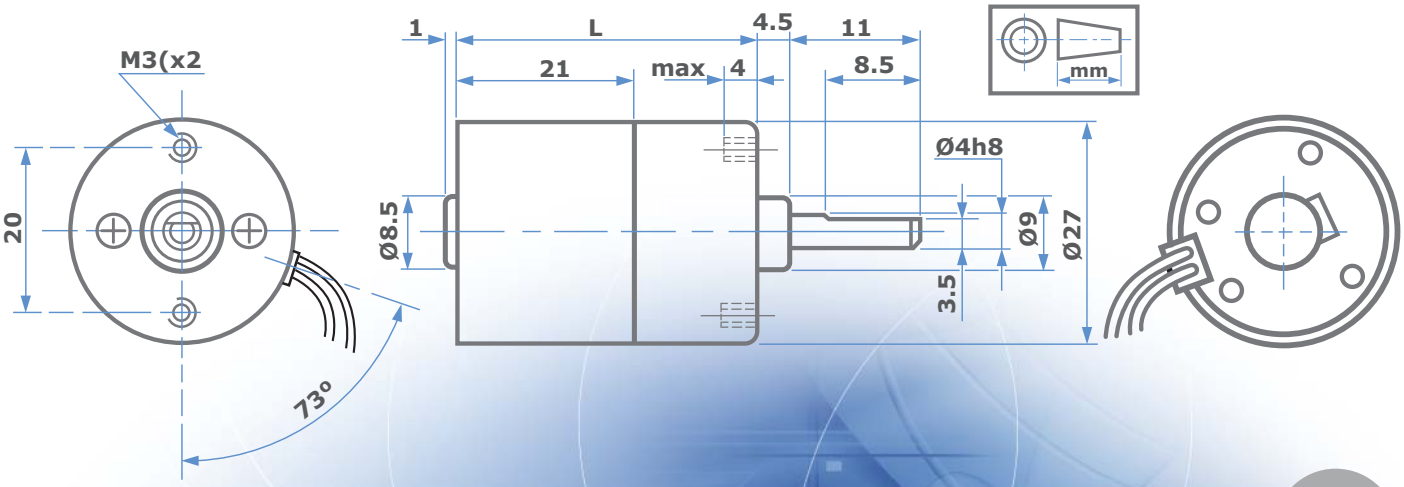
series **1271**

- 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
	v	mm		Ncm	rpm		mA	
1271· 4 6 12 ·10	4.5 6 12	36	10	1.5	255 215 255	165 120 165	<35 <30 <20	100 85 50
1271· 4 6 12 ·21	4.5 6 12	36	20.8	2.5	125 105 125	80 60 80	<35 <30 <20	100 85 50
1271· 4 6 12 ·43	4.5 6 12	41	43.3	3.8	60 52 60	40 32 40	<35 <30 <20	100 85 50
1271· 4 6 12 ·90	4.5 6 12	41	90.3	8	30 25 30	18 13 18	<35 <30 <20	100 85 50
1271· 4 6 12 ·188	4.5 6 12	46	188	14	14 12 14	9 7 9	<35 <30 <20	100 85 50
1271· 4 6 12 ·392	4.5 6 12	46	391.8	20	7 6 7	5 4 5	<35 <30 <20	90 75 45

1271



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TECHNICAL DATA

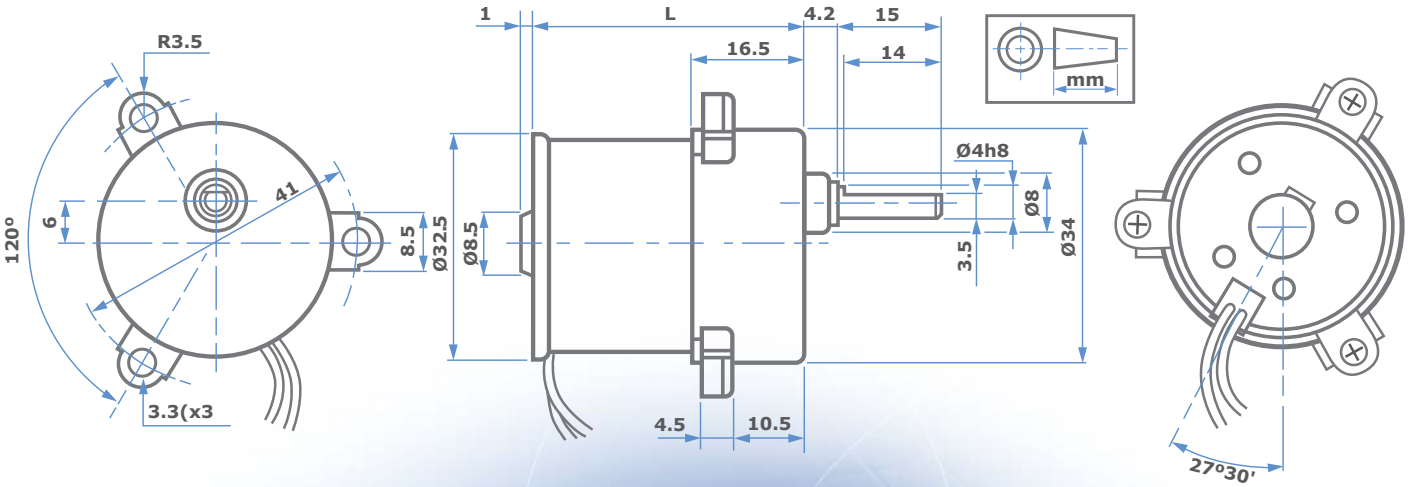
series **B138F**

- 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		mA	
B138F·$\frac{6}{12}$·12	$\frac{6}{12}$	37.5	12.25	1.5	220	155	$\frac{<30}{<20}$	$\frac{100}{55}$
B138F·$\frac{6}{12}$·21	$\frac{6}{12}$	37.5	21.14	2.5	125	85	$\frac{<30}{<20}$	$\frac{100}{55}$
B138F·$\frac{6}{12}$·36	$\frac{6}{12}$	37.5	35.73	4	73	53	$\frac{<30}{<20}$	$\frac{95}{50}$
B138F·$\frac{6}{12}$·72	$\frac{6}{12}$	37.5	71.54	7	37	28	$\frac{<30}{<20}$	$\frac{95}{50}$
B138F·$\frac{6}{12}$·149	$\frac{6}{12}$	37.5	149.05	14	18	13	$\frac{<30}{<20}$	$\frac{95}{50}$
B138F·$\frac{6}{12}$·208	$\frac{6}{12}$	37.5	208.66	20	13	9	$\frac{<30}{<20}$	$\frac{95}{50}$
B138F·$\frac{6}{12}$·608	$\frac{6}{12}$	37.5	608.61	50	4.3	3.3	$\frac{<30}{<20}$	$\frac{90}{48}$
B138F·$\frac{6}{12}$·1470	$\frac{6}{12}$	37.5	1470.82	50	1.8	1.6	$\frac{<30}{<20}$	$\frac{58}{30}$

B138F



B138F

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TECHNICAL DATA

series

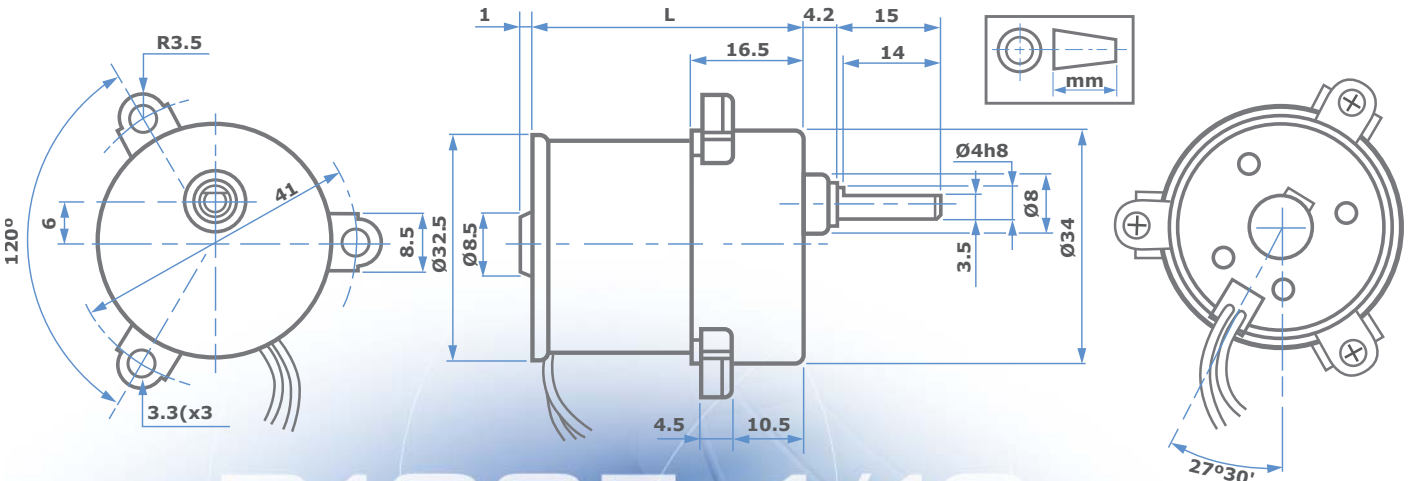
B138F.4/12

- 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
	v	mm		Ncm	rpm		mA	
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

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TECHNICAL DATA

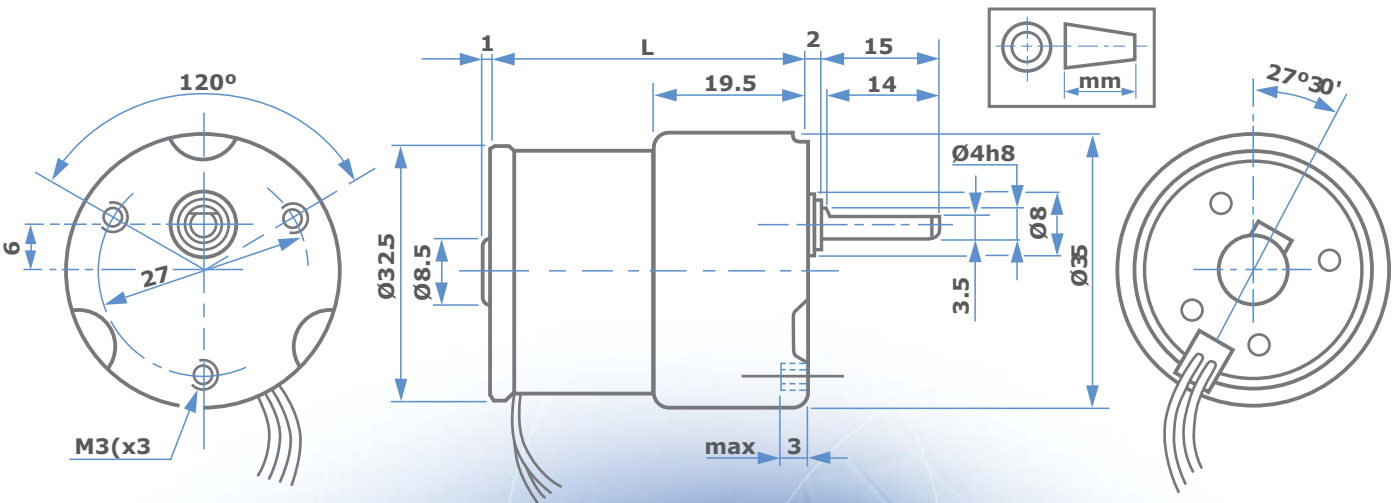
series **BS138F**

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

BS138F



BS138F

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TECHNICAL DATA

series

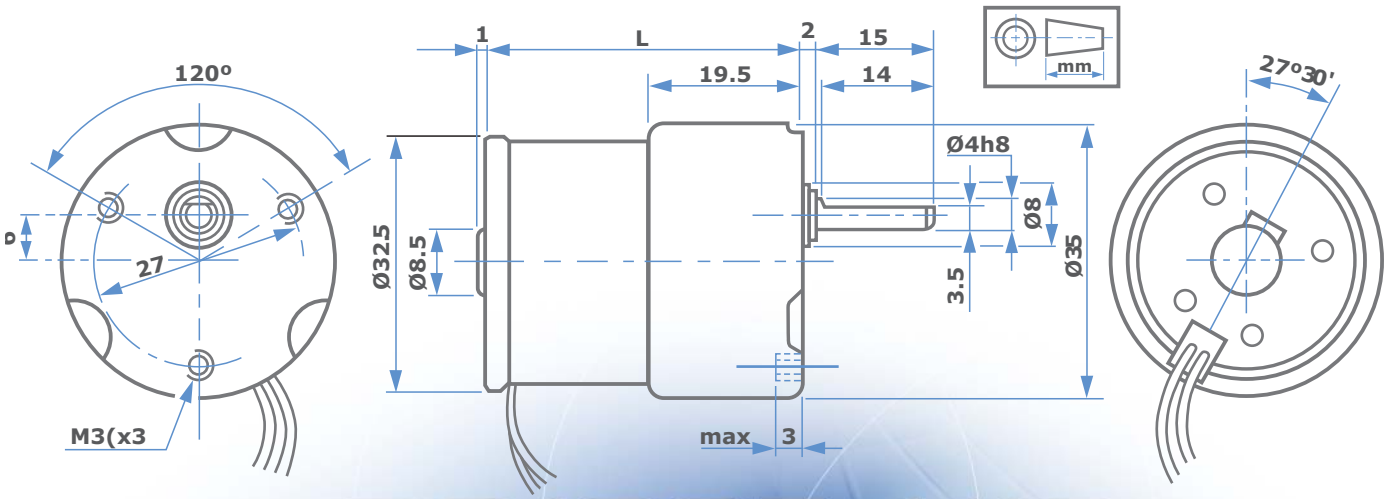
BS138F.4/12

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		mA	
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

micro motors s.r.l.

TECHNICAL DATA

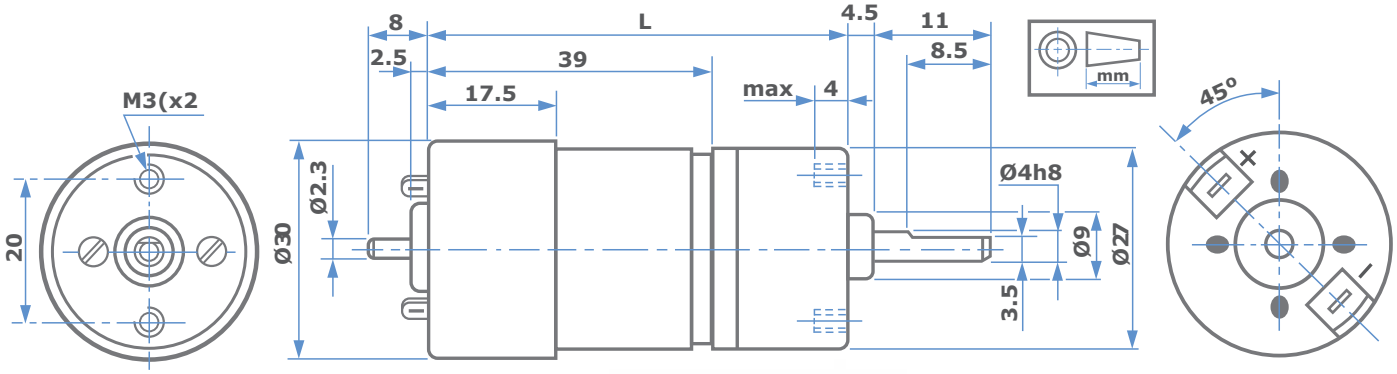
series **HL149**

- 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
	v	mm		Ncm	rpm		mA	
HL149· 12/24 ·10	12 24	57.5	10	4	315	220	<60 <50	210 120
HL149· 12/24 ·21	12 24	57.5	20.8	7.5	160	115	<60 <50	200 115
HL149· 12/24 ·43	12 24	62.5	43.3	15	78	55	<60 <50	210 120
HL149· 12/24 ·90	12 24	62.5	90.3	15	37	30	<60 <50	150 85

HL149



HL149

micro motors s.r.l.

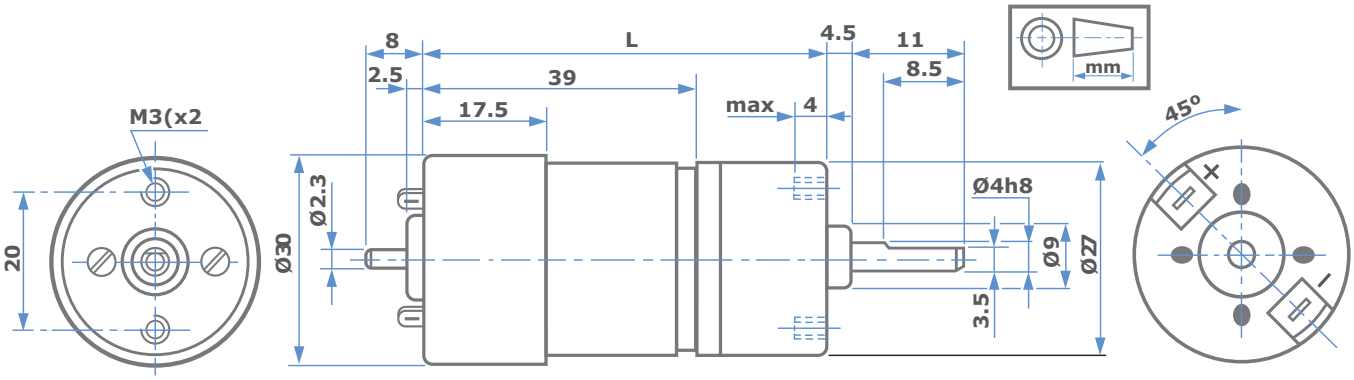
TECHNICAL DATA

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
	v	mm		Ncm	rpm		mA	
HV155·12/24·10	12 24	62.5	10	5	660	460	<140 <70	620 300
HV155·12/24·21	12 24	62.5	20.8	10	315	235	<140 <70	600 285
HV155·12/24·43	12 24	67.5	43.3	18	155	115	<140 <70	580 280
HV155·12/24·90	12 24	67.5	90.3	25	75	62	<140 <70	440 215



HV155

micro motors s.r.l.

TECHNICAL DATA

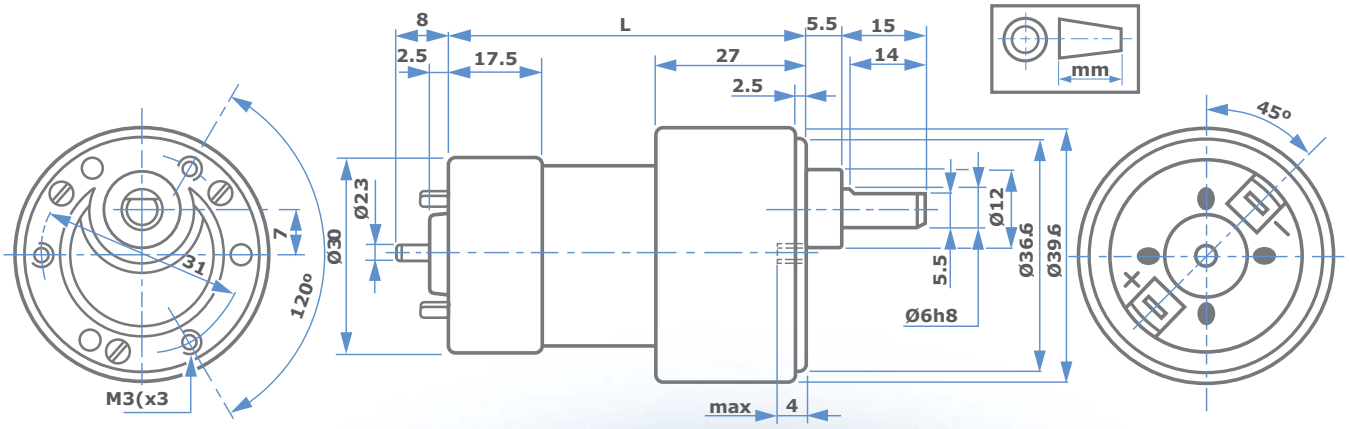
series **1308**

- 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
	v	mm		Ncm	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



micro motors s.r.l.

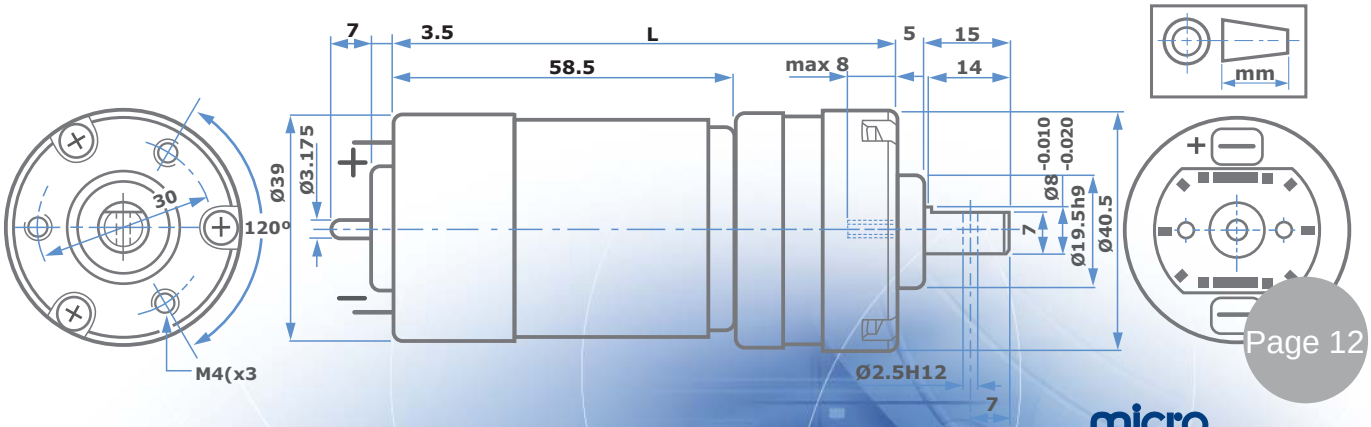
TECHNICAL DATA

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	
	v	mm		Ncm	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



micro motors s.r.l.

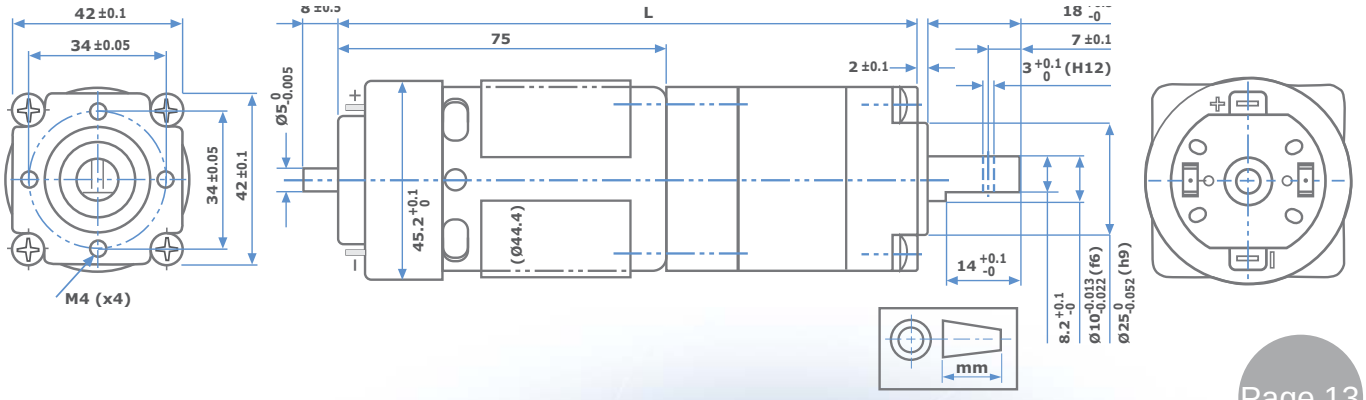
TECHNICAL DATA

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	
	v	mm		Ncm	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



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optional encoders

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

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micro motors s.r.l.

technology in motion

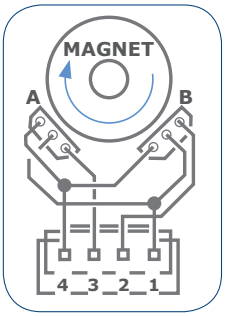
gear-motors with two-phase Hall-effect 90° encoder

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
Maximimum 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

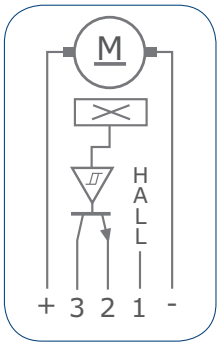
OC Operating Parameters TA = 25 °C, VDD = 3.5V to 24V (unless otherwise specified)

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.

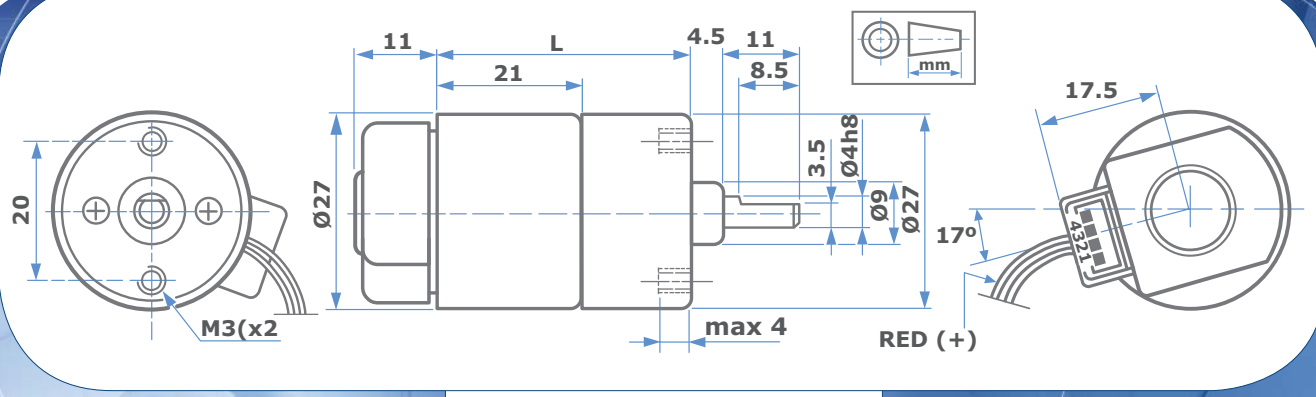
GENERAL ELECTRICAL SPECIFICATIONS

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

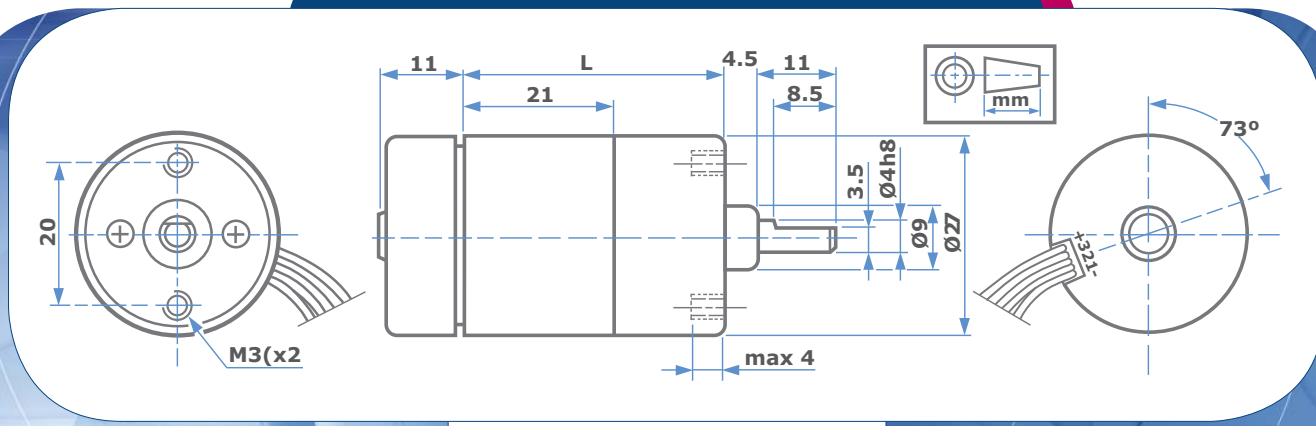
1271-2S



L = See: Series 1271

gear-motors with Hall-effect encoder

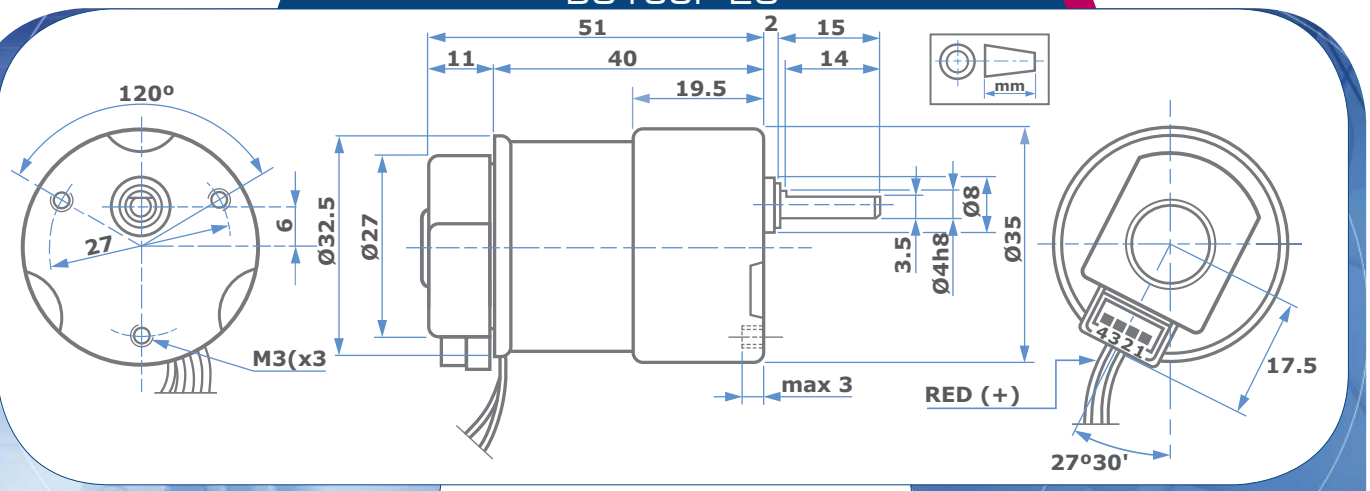
1271-E



L = See: Series 1271

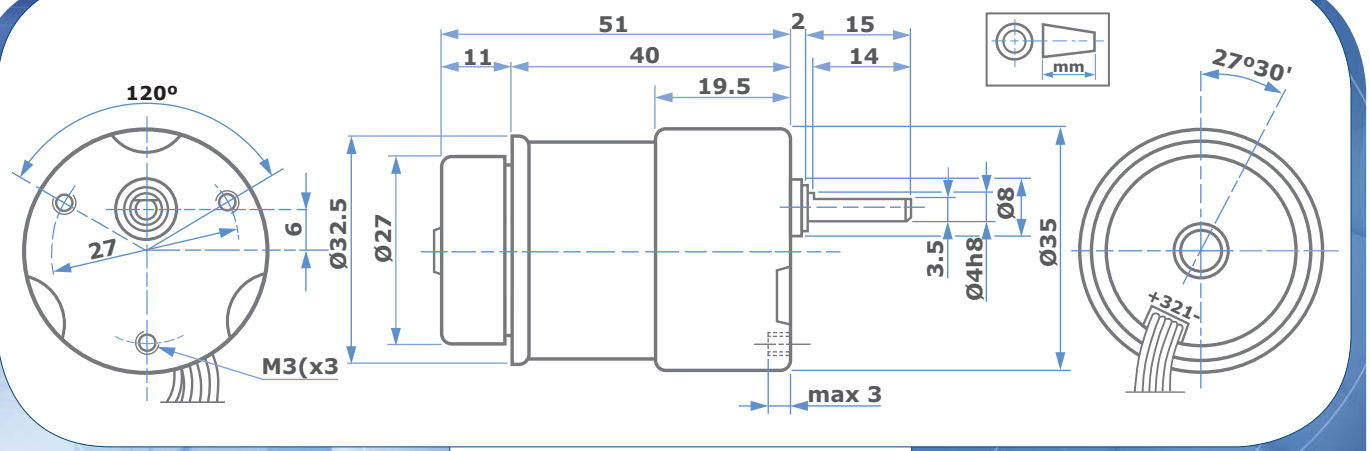
gear-motors with two-phase Hall-effect 90° encoder

BS138F-2S



gear-motors with Hall-effect encoder

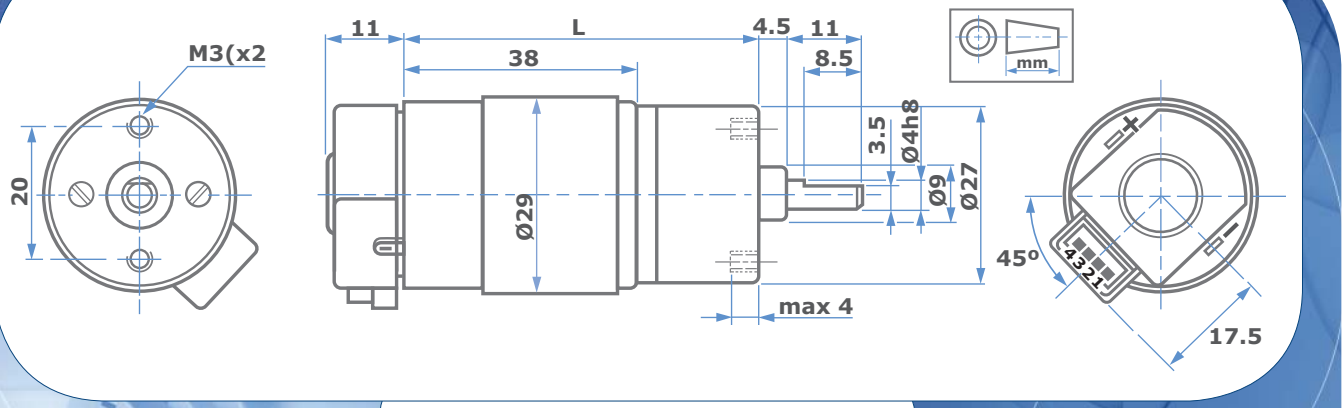
BSE138F



micro motors s.r.l.

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

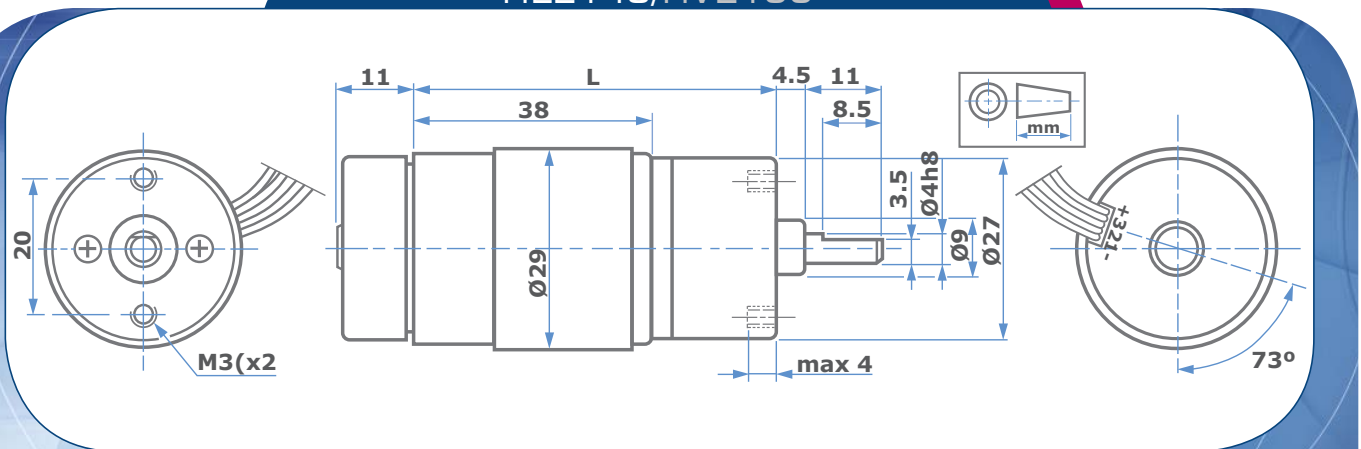
HL149-2S/HV155-2S



L = See: Series HL149 - HV155

gear-motors with Hall-effect encoder

HLE149/HVE155

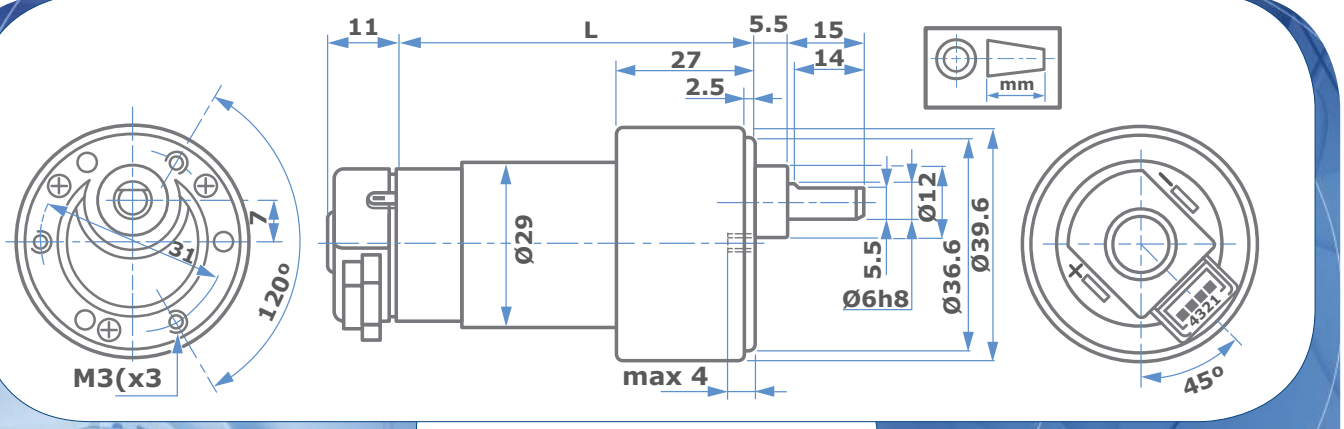


L = See: Series HL149 - HV155

micro motors s.r.l.

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

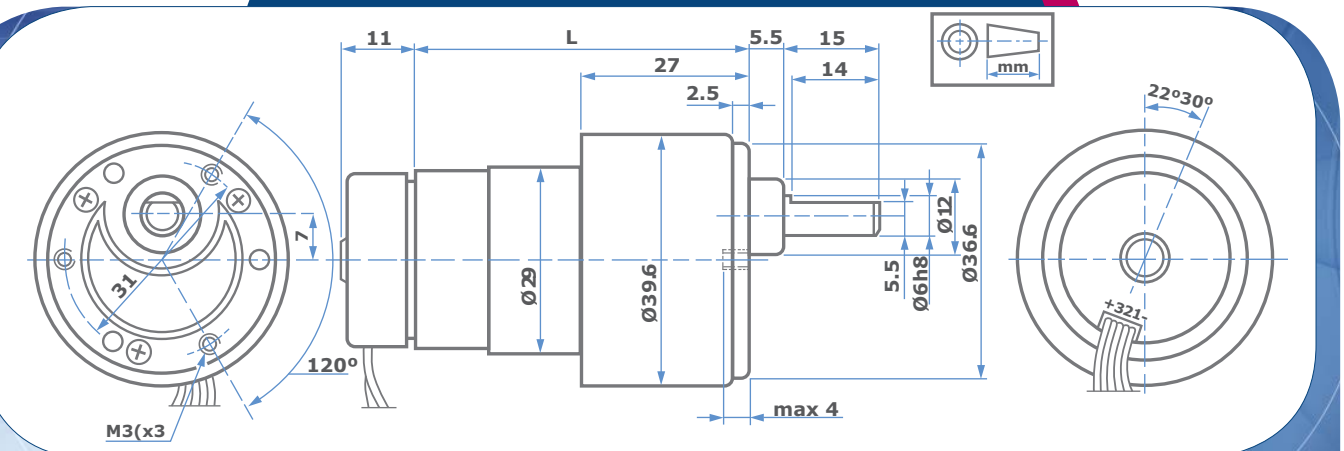
1308-2S



L = See: Series - 1308

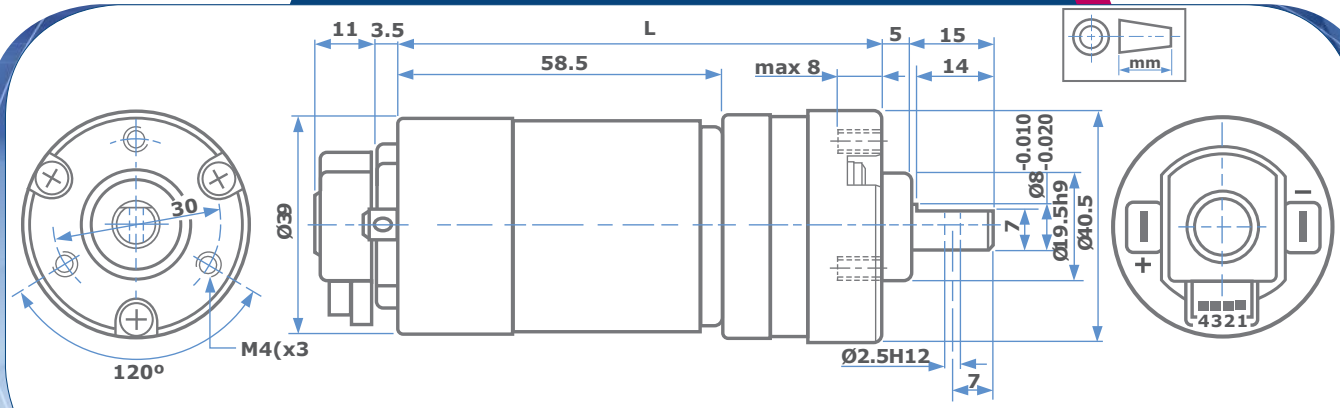
gear-motors with Hall-effect encoder

1308E



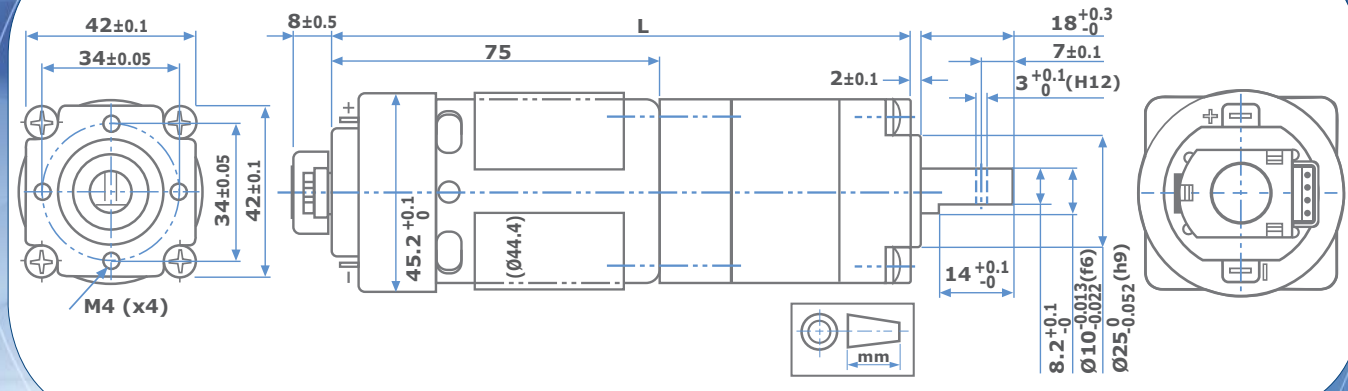
L = See: Series - 1308

E192-2S



L = See: Series E192

P205-2S



L = See: Series P205