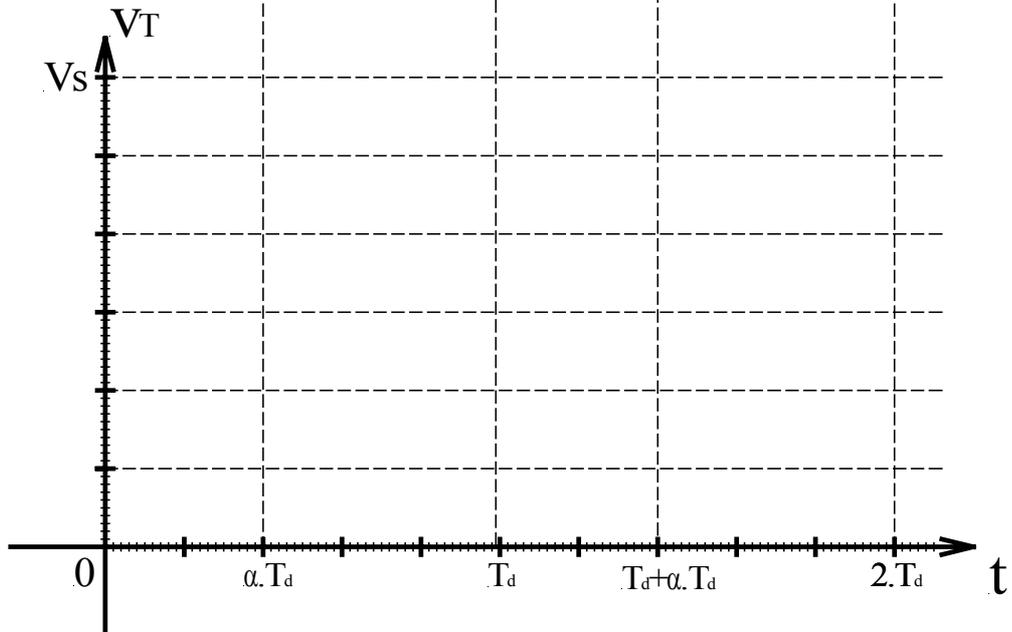
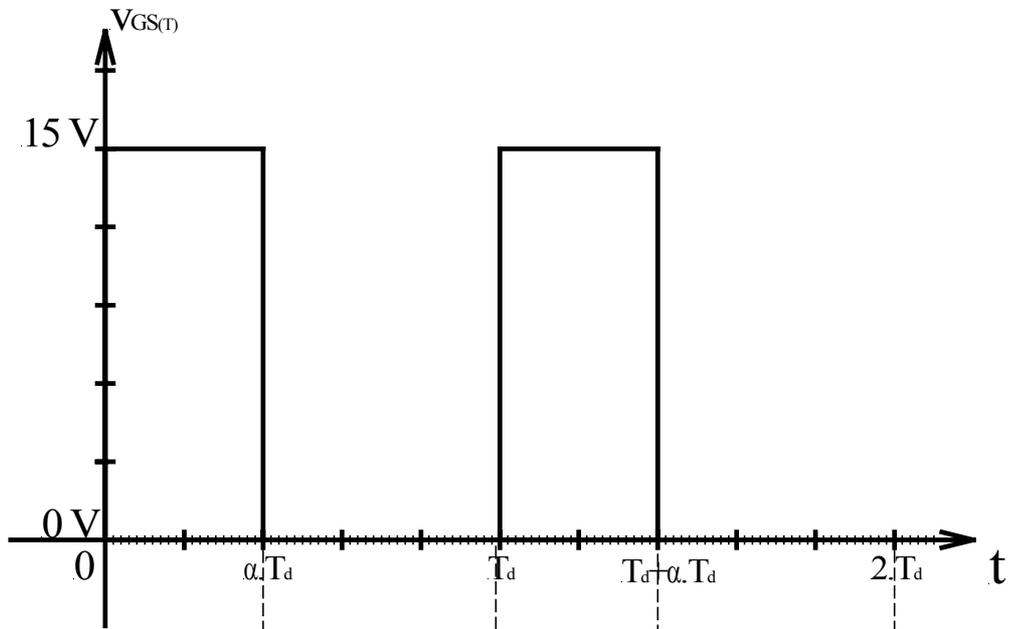
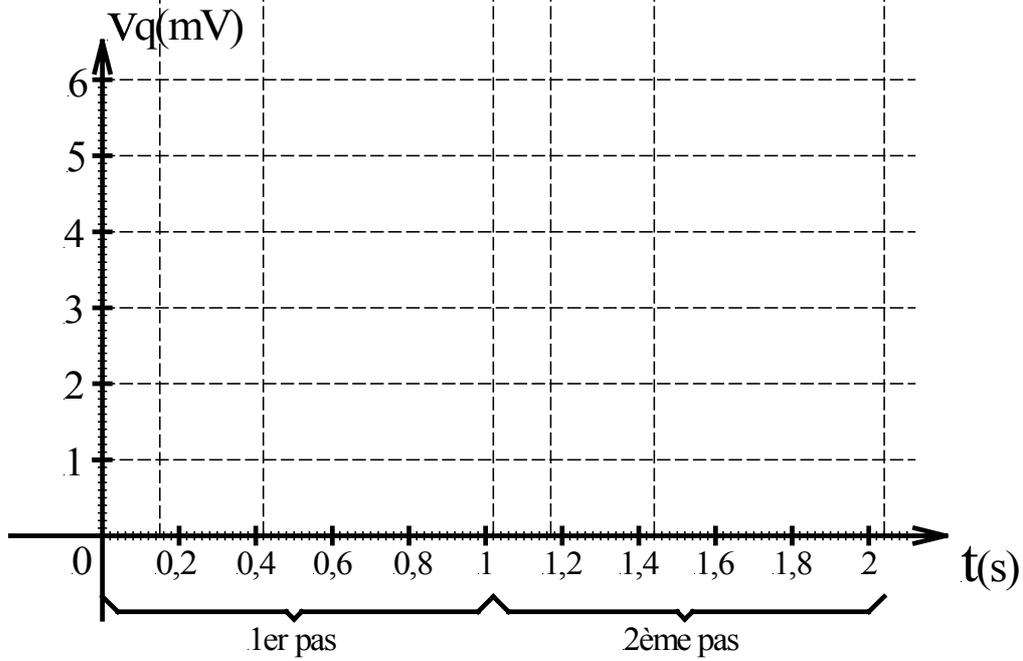
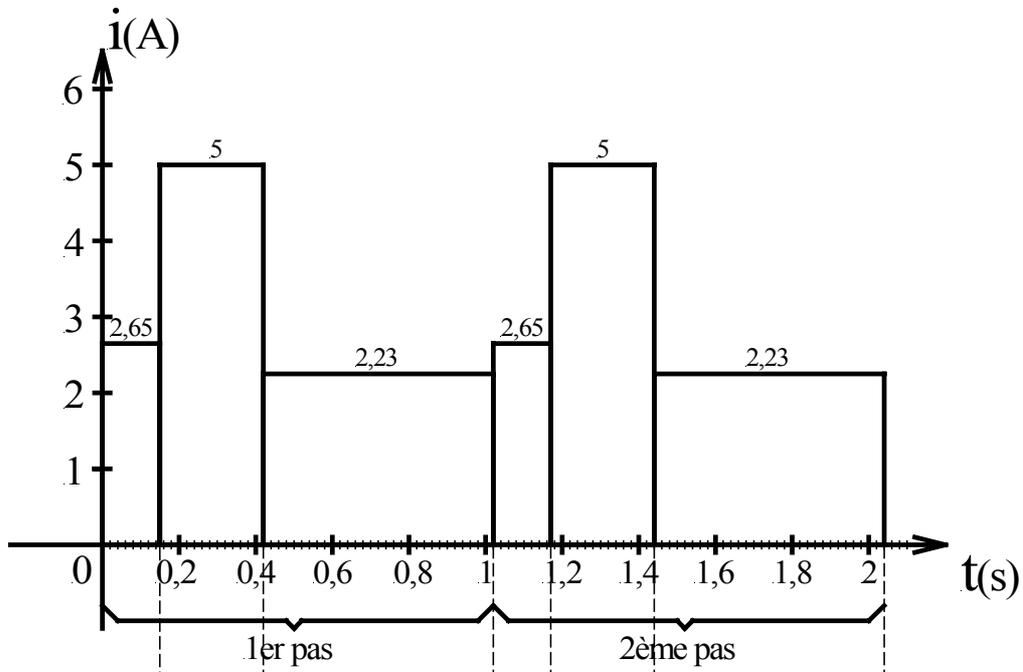


Document Réponse DR1

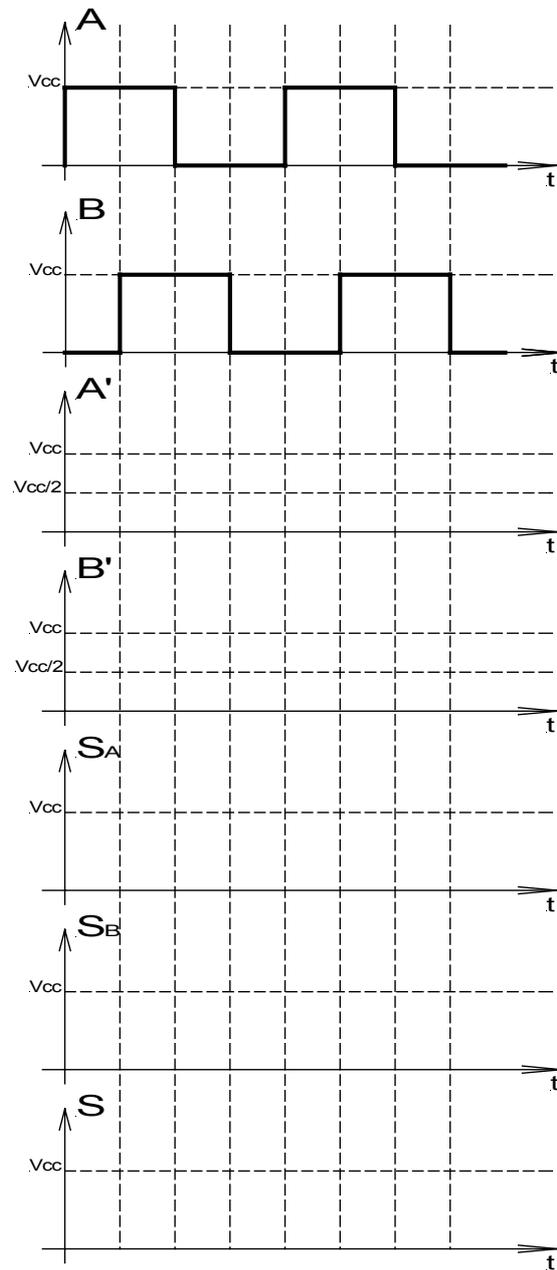


Document Réponse DR2

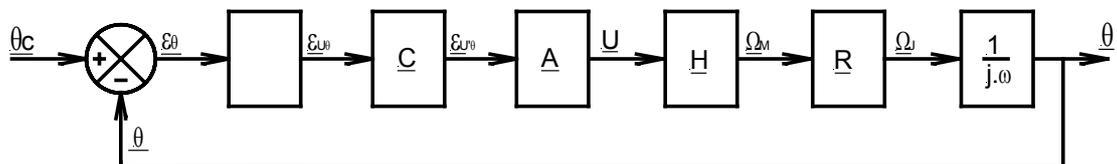


Document Réponse DR3

Question B.1.2.

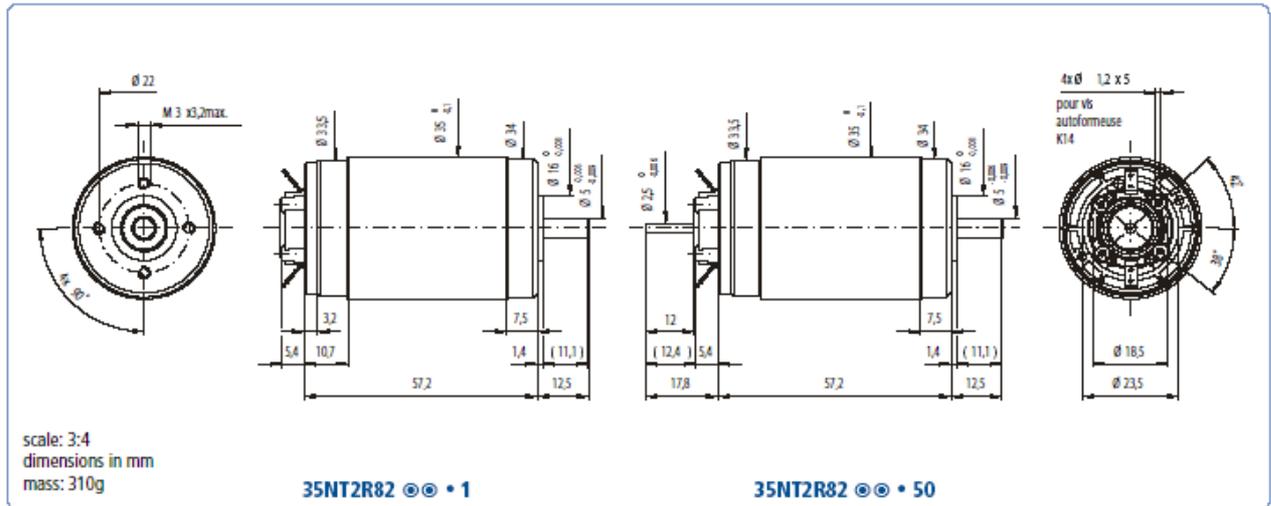


Question B.2.2.



## Annexe 1

Brushed DC	<b>Portescap</b>	escap 35NT2R82
102 Watt		Precious Metal Commutation System - 9 Segments



Winding Type	@ @	426P	426SP
<b>Measured Values</b>			
Measuring voltage	V	18	32
No-load speed	rpm	6700	5900
Stall torque	mNm (oz-in)	538 (76)	756 (107)
Average No-load current	mA	141	80
Typical starting voltage	V	--	--
<b>Max. Recommended Values</b>			
Max. continuous current	A	3.7	2.3
Max. continuous torque	mNm (oz-in)	90 (12.7)	115 (16.3)
Max. angular acceleration	10 <sup>3</sup> rad/s <sup>2</sup>	90 (12.7)	12.5
<b>Intrinsic Parameters</b>			
Back-EMF constant	V/1000 rpm	2.65	5.40
Torque constant	mNm/A (oz-in/A)	25.4 (3.6)	52 (7.3)
Terminal resistance	ohm	0.85	2.20
Motor regulation R/k <sup>2</sup>	10 <sup>3</sup> /Nms	1.3	0.83
Rotor inductance	mH	0.1	0.40
Rotor inertia	kgm <sup>2</sup> 10 <sup>-7</sup>	71.4	71.4
Mechanical time constant	ms	9	6

## Diagramme de sélection de capacité

TEMPÉRATURE : 20°C

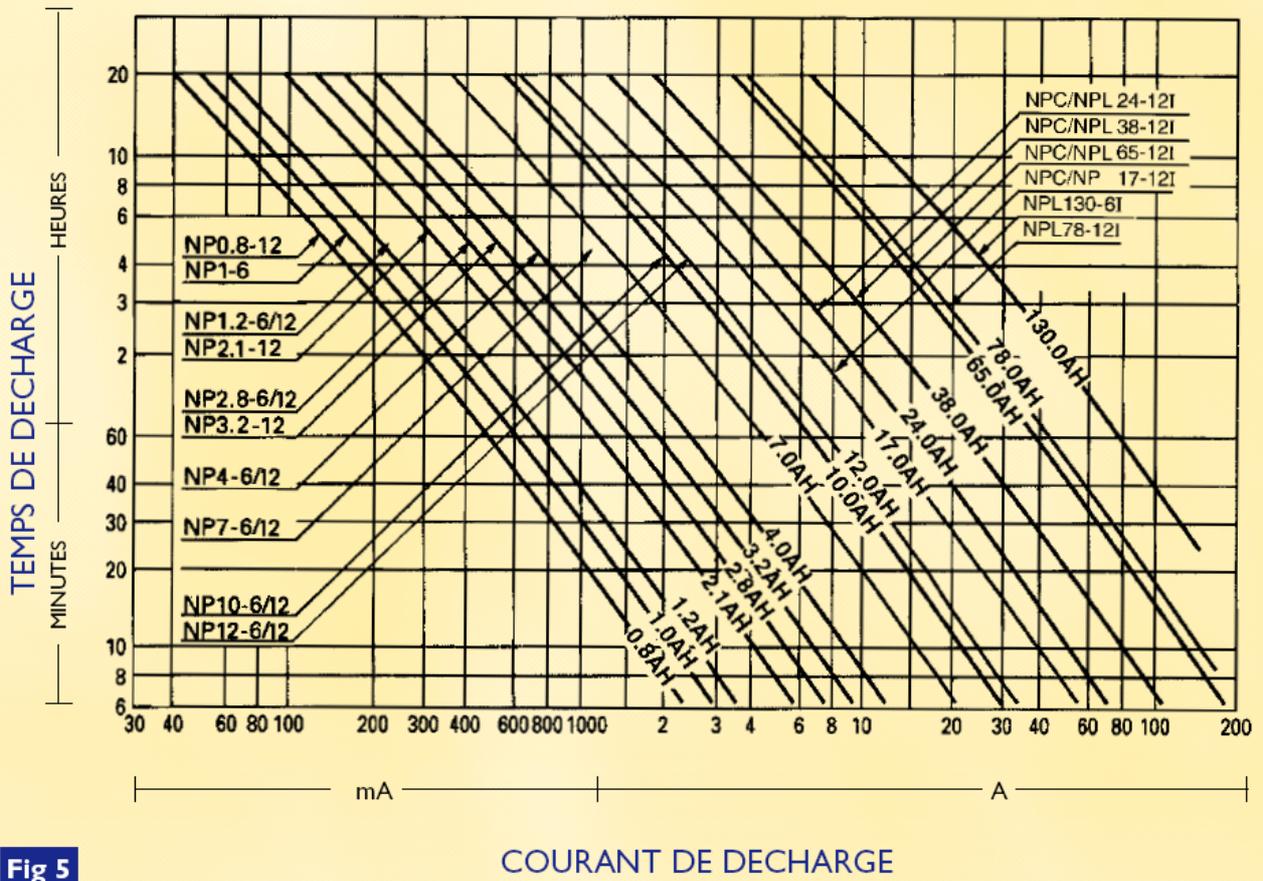
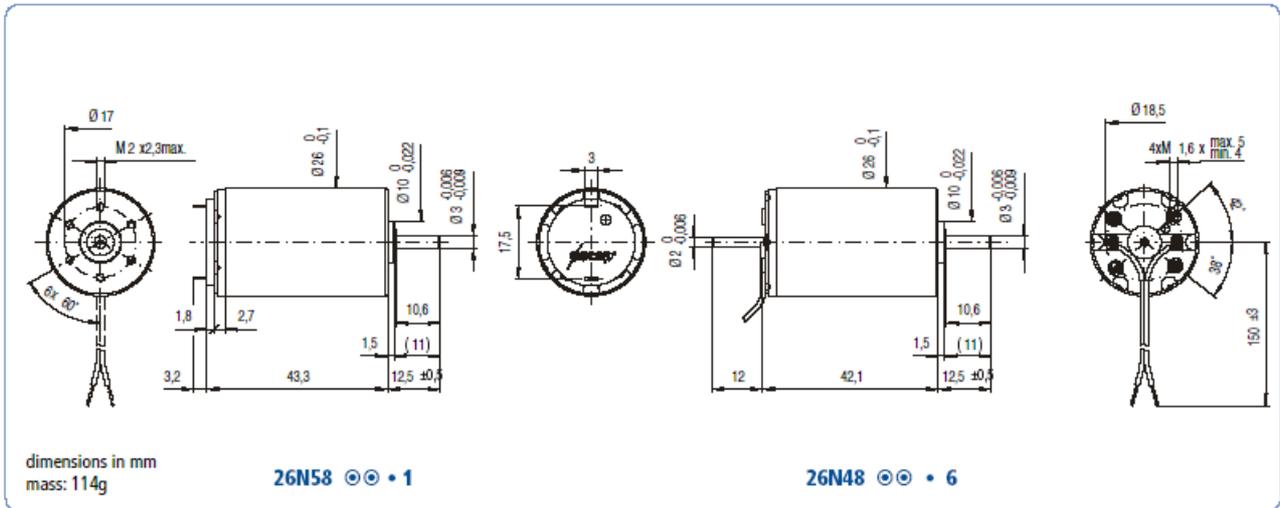


Fig 5

COURANT DE DECHARGE

## Annexe 3

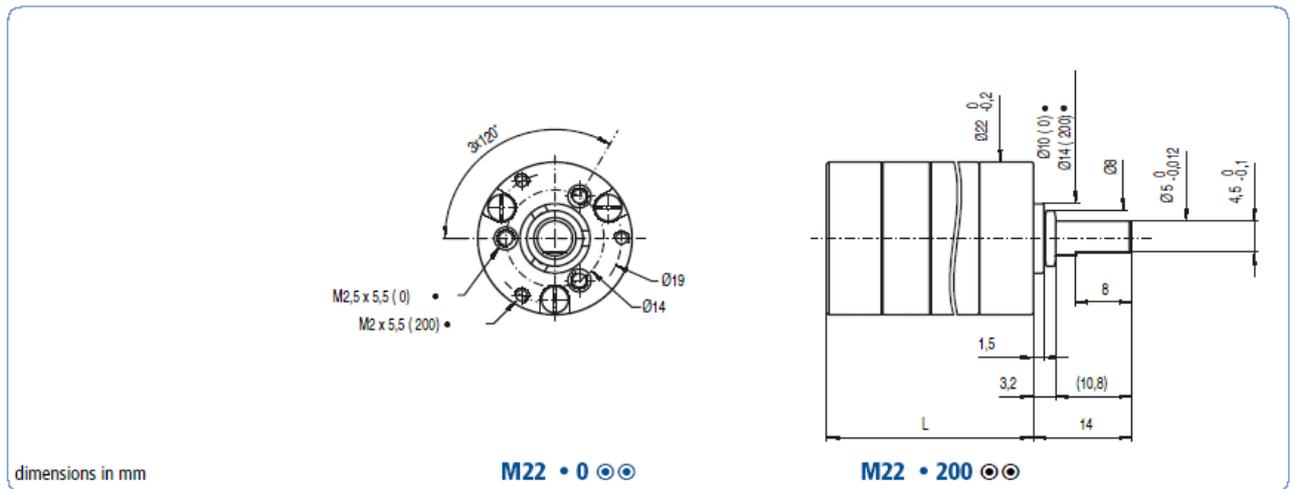
<b>escap 26N58/26N48</b>	<b>Portescap</b>	<b>Brushed DC</b>
Precious Metal Commutation System - 9 Segments		5.7 Watt



<b>Winding Type</b>	☉☉	-216P	-113P	-216E	-113	-110
<b>Measured Values</b>						
Measuring voltage	V	6	7.5	12	15	24
No-load speed	rpm	4500	5500	4700	5500	6700
Stall torque	mNm (oz-in)	29.6 (4.19)	25.5 (3.6)	28.6 (4.06)	25 (3.5)	25 (3.54)
Average No-load current	mA	31	30	16	15	12
Typical starting Voltage	V	0.08	0.1	0.15	0.2	0.28
<b>Max. Recommended Values</b>						
Max. continuous current	A	1.47	1.19	0.74	0.60	0.41
Max. continuous torque	mNm (oz-in)	17.9 (2.5)	15.7 (2.1)	17.3 (2.4)	15.1 (2.1)	13.3 (1.88)
Max. angular acceleration	10 <sup>3</sup> rad/s <sup>2</sup>	119	100	115	100	89
<b>Intrinsic Parameters</b>						
Back-EMF constant	V/1000 rpm	1.29	1.35	2.5	2.7	3.5
Torque constant	mNm/A (oz-in/A)	12.3 (1.74)	12.9 (1.83)	23.9 (3.38)	25.8 (3.65)	33.5 (4.74)
Terminal resistance	ohm	2.5	3.8	10	15.2	32
Motor regulation R/k <sup>2</sup>	10 <sup>3</sup> /Nms	16	23	18	23	29
Rotor inductance	mH	0.2	0.3	0.8	1.1	1.7
Rotor inertia	kgm <sup>2</sup> 10 <sup>-7</sup>	6	6	6	6.7	6
Mechanical time constant	ms	9.7	14	11	14	17

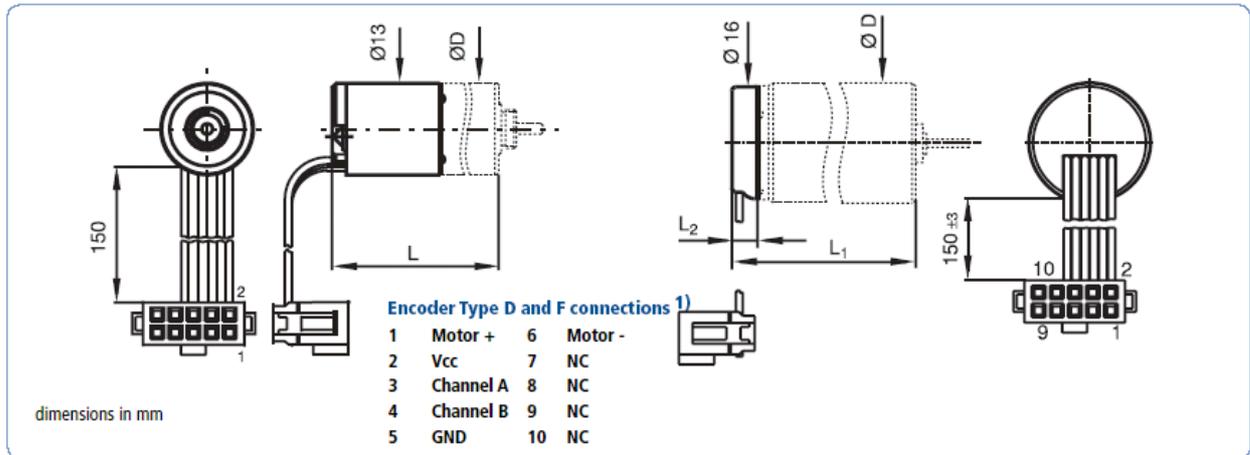
## Annexe 4

<b>escap M22</b>		<b>Portescap</b>	<b>Gearhead</b>
Planetary Gearhead			1.5 Nm



<b>Ratio</b>	☉☉	3.67	5	13.4	18.3	25	49.3	67.2	91.7	125	180.8	246.5	336.1	458.3	625	903.8
No. of gear stages		1	1	2	2	2	3	3	3	3	4	4	4	4	4	5
Direction of Rotation		=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Mass (g)		26	26	33	33	33	40	40	40	40	47	47	47	47	47	54
Available with motor																
22N28 • 286/ 22N48 • 308																
22V28 • 201/22V48 • 204																
25GST82 • 1/2/3																
23V58 • 4/23V48 • 11																
26N58 • 5/26N48 • 9																
28L28 • 164 / 28L28 • 317																
28LT12•164																

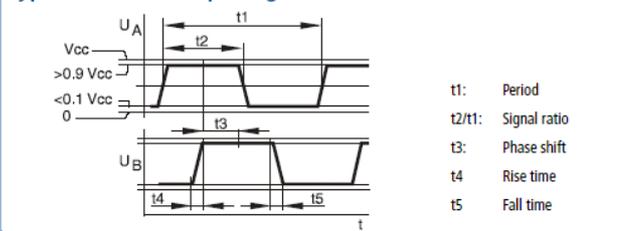
## Annexe 5



### Characteristics at 22 °C

			D	F
Number of pulses per rev			12;	16
Supply voltage	Vcc	V	5	3.5...15
Supply current	typical at 5 V	mA	4	6
Rise time	t4	µs	0.125	5
Fall time	t5	µs	0.05	0.2
Output signal <sup>2)</sup>			Two channels / square wave in quadrature	
Electrical phase shift between U1 and U2	t3/t1 x 360	degree	90 ± 40	
Signal ratio <sup>3)</sup>	t2/t1	%	50 ± 25	
Max. count frequency		kHz	10	15
Operating temperature range		°C	-20...+85	
Inertia		10 <sup>-7</sup> x kgm <sup>2</sup>	0.1	
Measuring conditions	Temperature	°C	22	
	Supply voltage	V	5	
	Load resistance	Mohm	1	
	Load capacity	pF	25	

### Typical Encoder Output Signal



- 1) Connector Dupont type Quikie II or equivalent
- 2) Internal pull-up resistor: 10 kohm only available with the F type encoder
- 3) Over the entire frequency and temperature range

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Annexe 6

