

Report calculated on Test Bench Results

Motor type: **NOVA 4-30-B8 P20**

Date: 08.04.2024

Bearing type: regular

Controller: Common ESC

Measuring Parameter

Voltage: **15.0 [V]**

Throttle setting: 100%

Calculated Motor Constants

nl: 4,132.5 [RPM] lo: 3.4 [A] kv: 279.0 [RPM/V] kn: -15.48 [RPM/A] kT: 3.86 [Ncm/A]

Voltage [V]	Current [A]	Speed [RPM]	Input Power [W]	Output Power [W]	Torque [Ncm]	Efficiency ¹ [%]
15.0	10.0	4,030.3	150.0	107.6	25.5	71.75
15.0	12.0	3,999.3	180.0	139.0	33.2	77.25
15.0	14.0	3,968.3	210.0	170.0	40.9	80.94
15.0	16.0	3,937.4	240.0	200.4	48.6	83.50
15.0	18.0	3,906.4	270.0	230.3	56.3	85.30
14.9	20.0	3,875.5	298.0	260.1	64.1	87.30
14.9	22.0	3,844.5	327.8	289.1	71.8	88.18
14.9	24.0	3,813.6	357.6	317.5	79.5	88.78
14.9	26.0	3,782.6	387.4	345.4	87.2	89.16
14.9	28.0	3,751.6	417.2	372.8	94.9	89.36
14.9	30.0	3,720.7	447.0	399.8	102.6	89.43
14.9	32.0	3,689.7	476.8	426.6	110.4	89.46
14.9	34.0	3,658.8	506.6	452.5	118.1	89.32
14.9	36.0	3,627.8	536.4	477.9	125.8	89.10
14.9	38.0	3,596.8	566.2	502.8	133.5	88.81
14.9	40.0	3,565.9	596.0	527.3	141.2	88.47
14.9	42.0	3,534.9	625.8	551.2	148.9	88.08
14.9	44.0	3,504.0	655.6	575.0	156.7	87.70
14.9	46.0	3,473.0	685.4	597.9	164.4	87.24
14.9	48.0	3,442.0	715.2	620.3	172.1	86.73
14.9	50.0	3,411.1	745.0	642.3	179.8	86.21
14.9	52.0	3,380.1	774.8	663.7	187.5	85.66
14.9	54.0	3,349.2	804.6	684.6	195.2	85.09
14.9	56.0	3,318.2	834.4	705.4	203.0	84.54
14.8	58.0	3,287.3	858.4	725.3	210.7	84.50
14.8	60.0	3,256.3	888.0	744.7	218.4	83.87

Voltage [V]	Current [A]	Speed [RPM]	Input Power [W]	Output Power [W]	Torque [Ncm]	Efficiency ¹ [%]
14.8	62.0	3,225.3	917.6	763.7	226.1	83.22
14.8	64.0	3,194.4	947.2	782.1	233.8	82.57
14.8	66.0	3,163.4	976.8	800.0	241.5	81.90
14.8	68.0	3,132.5	1,006.4	817.8	249.3	81.26
14.8	70.0	3,101.5	1,036.0	834.7	257.0	80.57
14.8	72.0	3,070.5	1,065.6	851.1	264.7	79.87
14.8	74.0	3,039.6	1,095.2	867.1	272.4	79.17
14.8	76.0	3,008.6	1,124.8	882.5	280.1	78.46
14.8	78.0	2,977.7	1,154.4	897.4	287.8	77.74
14.8	80.0	2,946.7	1,184.0	912.2	295.6	77.04
14.8	82.0	2,915.8	1,213.6	926.1	303.3	76.31
14.8	84.0	2,884.8	1,243.2	939.5	311.0	75.57
14.8	86.0	2,853.8	1,272.8	952.4	318.7	74.83
14.8	88.0	2,822.9	1,302.4	964.9	326.4	74.08
14.8	90.0	2,791.9	1,332.0	976.8	334.1	73.33
14.8	92.0	2,761.0	1,361.6	988.5	341.9	72.60
14.8	94.0	2,730.0	1,391.2	999.5	349.6	71.84
14.8	96.0	2,699.0	1,420.8	1,009.9	357.3	71.08
14.7	98.0	2,668.1	1,440.6	1,019.8	365.0	70.79
14.7	100.0	2,637.1	1,470.0	1,029.2	372.7	70.02
14.7	102.0	2,606.2	1,499.4	1,038.2	380.4	69.24
14.7	104.0	2,575.2	1,528.8	1,046.9	388.2	68.48
14.7	106.0	2,544.2	1,558.2	1,054.8	395.9	67.69
14.7	108.0	2,513.3	1,587.6	1,062.2	403.6	66.91
14.7	110.0	2,482.3	1,617.0	1,069.2	411.3	66.12

nl = rpm with no load

lo = current with no load

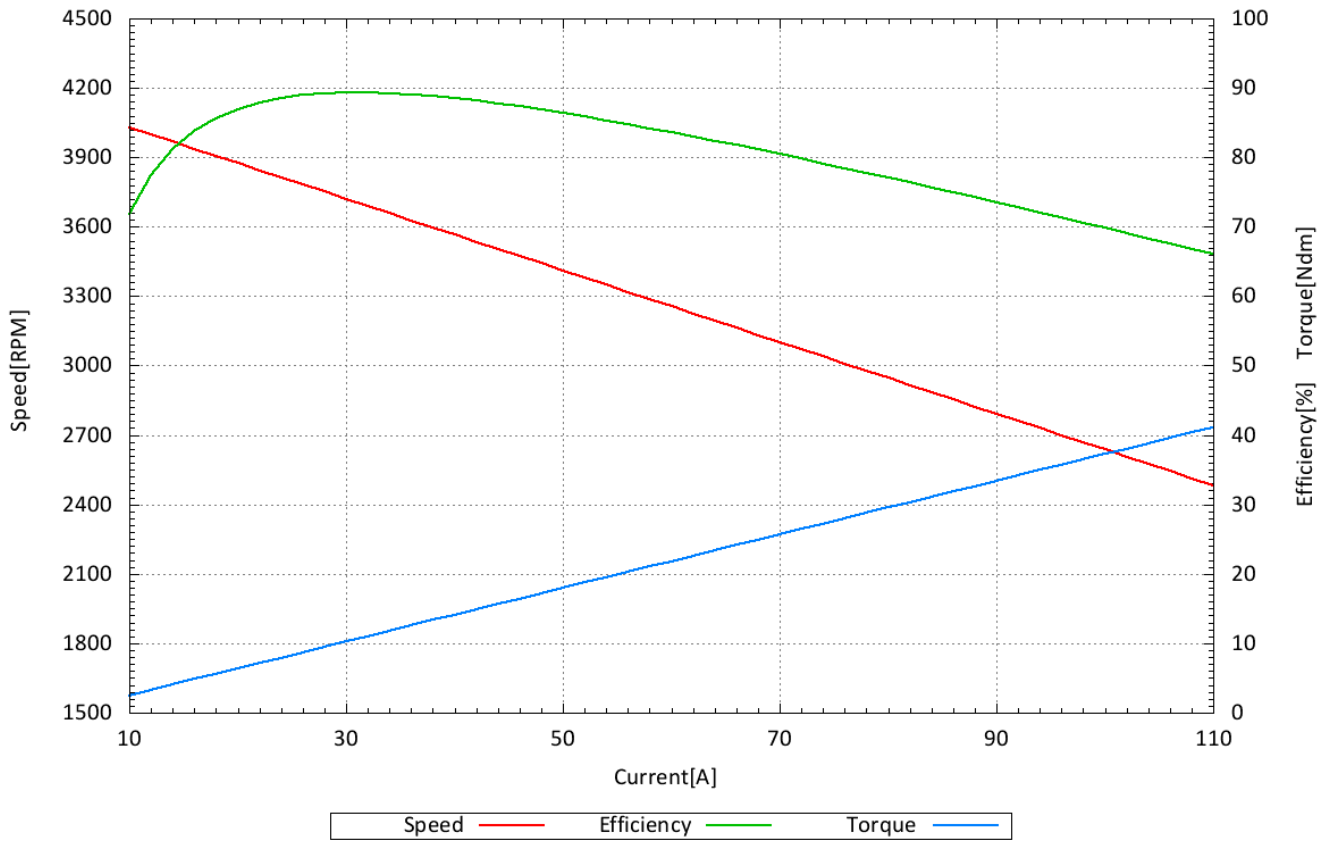
kV = specific rpm

kn = rpm drop per Amp

kT = torque constant

¹ incl. Controller

HP430_30_B8_P20_15V_08042024



Report calculated on Test Bench Results

Motor type: **NOVA 4-30-B8 P20**

Date: 08.04.2024

Bearing type: regular

Controller: Common ESC

Measuring Parameter

Voltage: **20.0 [V]**

Throttle setting: 100%

Calculated Motor Constants

nl: 5,536.4 [RPM] lo: 2.9 [A] kv: 279.5 [RPM/V] kn: -18.37 [RPM/A] kT: 3.76 [Ncm/A]

Voltage [V]	Current [A]	Speed [RPM]	Input Power [W]	Output Power [W]	Torque [Ncm]	Efficiency ¹ [%]
20.0	10.0	5,406.3	200.0	151.2	26.7	75.58
20.0	12.0	5,369.6	240.0	192.3	34.2	80.13
20.0	14.0	5,332.8	280.0	232.9	41.7	83.17
19.9	16.0	5,296.1	318.4	272.9	49.2	85.70
19.9	18.0	5,259.3	358.2	312.8	56.8	87.33
19.9	20.0	5,222.6	398.0	351.7	64.3	88.36
19.9	22.0	5,185.8	437.8	389.9	71.8	89.06
19.9	24.0	5,149.1	477.6	428.1	79.4	89.64
19.9	26.0	5,112.3	517.4	465.2	86.9	89.92
19.9	28.0	5,075.6	557.2	501.8	94.4	90.05
19.9	30.0	5,038.8	597.0	537.7	101.9	90.06
19.9	32.0	5,002.1	636.8	573.6	109.5	90.07
19.9	34.0	4,965.3	676.6	608.4	117.0	89.91
19.9	36.0	4,928.6	716.4	642.6	124.5	89.69
19.9	38.0	4,891.8	756.2	676.2	132.0	89.42
19.9	40.0	4,855.1	796.0	709.8	139.6	89.17
19.9	42.0	4,818.3	835.8	742.2	147.1	88.80
19.9	44.0	4,781.6	875.6	774.1	154.6	88.41
19.8	46.0	4,744.8	910.8	805.9	162.2	88.49
19.8	48.0	4,708.1	950.4	836.7	169.7	88.03
19.8	50.0	4,671.4	990.0	866.8	177.2	87.56
19.8	52.0	4,634.6	1,029.6	896.4	184.7	87.06
19.8	54.0	4,597.9	1,069.2	925.9	192.3	86.60
19.8	56.0	4,561.1	1,108.8	954.3	199.8	86.07
19.8	58.0	4,524.4	1,148.4	982.2	207.3	85.53
19.8	60.0	4,487.6	1,188.0	1,009.4	214.8	84.97

Voltage [V]	Current [A]	Speed [RPM]	Input Power [W]	Output Power [W]	Torque [Ncm]	Efficiency ¹ [%]
19.8	62.0	4,450.9	1,227.6	1,036.6	222.4	84.44
19.8	64.0	4,414.1	1,267.2	1,062.7	229.9	83.86
19.8	66.0	4,377.4	1,306.8	1,088.2	237.4	83.28
19.8	68.0	4,340.6	1,346.4	1,113.6	245.0	82.71
19.8	70.0	4,303.9	1,386.0	1,138.0	252.5	82.11
19.8	72.0	4,267.1	1,425.6	1,161.8	260.0	81.50
19.8	74.0	4,230.4	1,465.2	1,185.0	267.5	80.88
19.7	76.0	4,193.6	1,497.2	1,208.1	275.1	80.69
19.7	78.0	4,156.9	1,536.6	1,230.2	282.6	80.06
19.7	80.0	4,120.1	1,576.0	1,251.7	290.1	79.42
19.7	82.0	4,083.4	1,615.4	1,272.6	297.6	78.78
19.7	84.0	4,046.6	1,654.8	1,293.3	305.2	78.16
19.7	86.0	4,009.9	1,694.2	1,313.1	312.7	77.50
19.7	88.0	3,973.2	1,733.6	1,332.3	320.2	76.85
19.7	90.0	3,936.4	1,773.0	1,351.3	327.8	76.21
19.7	92.0	3,899.7	1,812.4	1,369.3	335.3	75.55
19.7	94.0	3,862.9	1,851.8	1,386.7	342.8	74.88
19.7	96.0	3,826.2	1,891.2	1,403.6	350.3	74.22
19.7	98.0	3,789.4	1,930.6	1,420.2	357.9	73.56
19.7	100.0	3,752.7	1,970.0	1,436.0	365.4	72.89
19.7	102.0	3,715.9	2,009.4	1,451.1	372.9	72.21
19.7	104.0	3,679.2	2,048.8	1,465.6	380.4	71.54
19.6	106.0	3,642.4	2,077.6	1,480.0	388.0	71.23
19.6	108.0	3,605.7	2,116.8	1,493.4	395.5	70.55
19.6	110.0	3,568.9	2,156.0	1,506.1	403.0	69.86

nl = rpm with no load

lo = current with no load

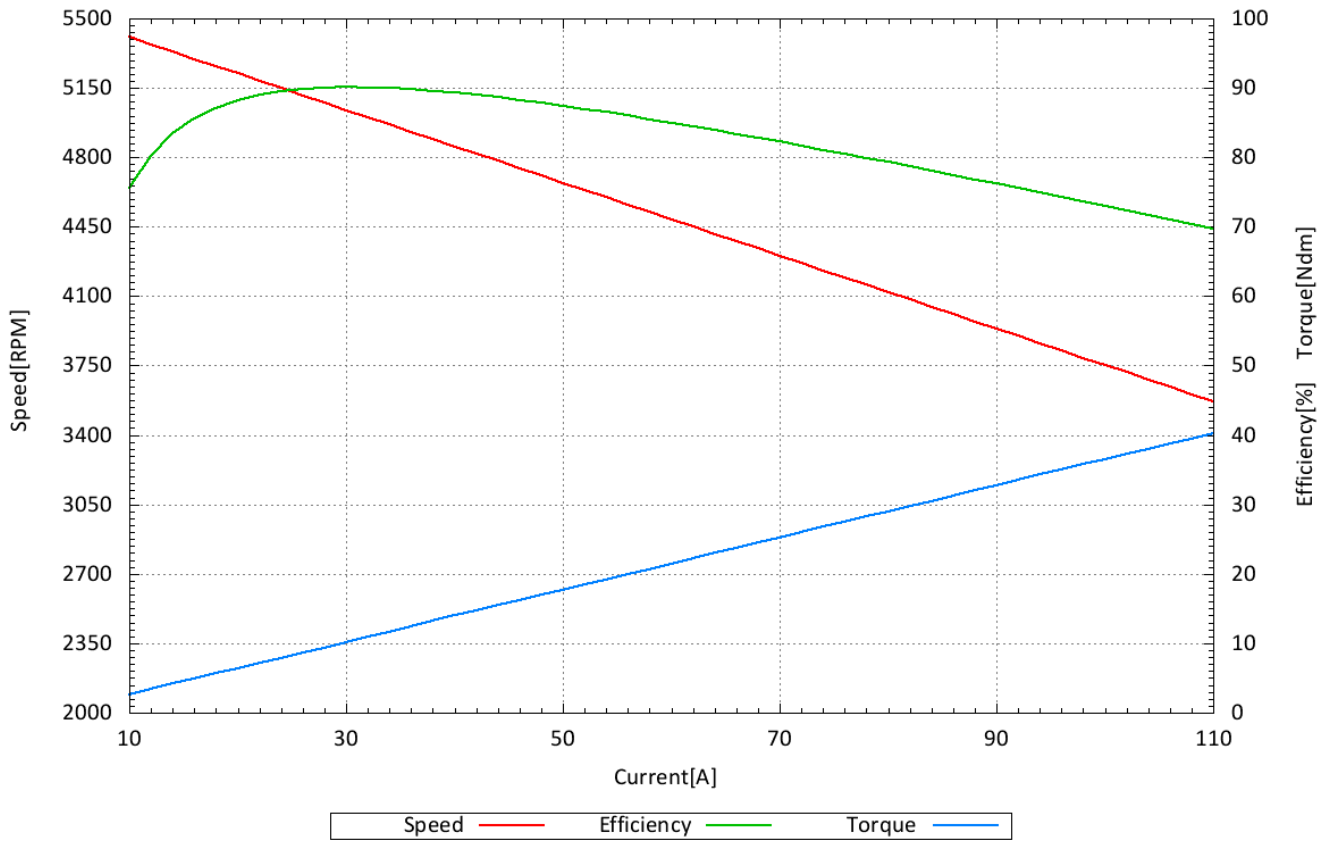
kV = specific rpm

kn = rpm drop per Amp

kT = torque constant

¹ incl. Controller

HP430_30_B8_P20_20V_08042024



Report calculated on Test Bench Results

Motor type: **NOVA 4-30-B8 P20**

Date: 08.04.2024

Bearing type: regular

Controller: Common ESC

Measuring Parameter

Voltage: **25.0 [V]**

Throttle setting: 100%

Calculated Motor Constants

nl: 6,850.7 [RPM] lo: 3.4 [A] kv: 276.8 [RPM/V] kn: -19.90 [RPM/A] kT: 3.82 [Ncm/A]

Voltage [V]	Current [A]	Speed [RPM]	Input Power [W]	Output Power [W]	Torque [Ncm]	Efficiency ¹ [%]
25.0	10.0	6,719.8	250.0	176.6	25.1	70.65
25.0	12.0	6,680.0	300.0	229.4	32.8	76.48
25.0	14.0	6,640.1	350.0	280.9	40.4	80.26
24.9	16.0	6,600.3	398.4	332.5	48.1	83.45
24.9	18.0	6,560.5	448.2	382.7	55.7	85.38
24.9	20.0	6,520.7	498.0	432.9	63.4	86.93
24.9	22.0	6,480.9	547.8	481.9	71.0	87.96
24.9	24.0	6,441.1	597.6	530.2	78.6	88.72
24.9	26.0	6,401.3	647.4	578.5	86.3	89.36
24.9	28.0	6,361.5	697.2	625.5	93.9	89.72
24.9	30.0	6,321.7	747.0	672.6	101.6	90.04
24.9	32.0	6,281.9	796.8	718.4	109.2	90.16
24.9	34.0	6,242.1	846.6	764.1	116.9	90.26
24.9	36.0	6,202.3	896.4	808.6	124.5	90.21
24.9	38.0	6,162.5	946.2	852.5	132.1	90.10
24.9	40.0	6,122.7	996.0	896.4	139.8	90.00
24.9	42.0	6,082.9	1,045.8	938.9	147.4	89.78
24.8	44.0	6,043.1	1,091.2	981.5	155.1	89.95
24.8	46.0	6,003.3	1,140.8	1,022.8	162.7	89.66
24.8	48.0	5,963.5	1,190.4	1,064.1	170.4	89.39
24.8	50.0	5,923.7	1,240.0	1,104.2	178.0	89.05
24.8	52.0	5,883.9	1,289.6	1,143.6	185.6	88.68
24.8	54.0	5,844.0	1,339.2	1,183.0	193.3	88.33
24.8	56.0	5,804.2	1,388.8	1,221.1	200.9	87.92
24.8	58.0	5,764.4	1,438.4	1,259.2	208.6	87.54
24.8	60.0	5,724.6	1,488.0	1,296.1	216.2	87.10

Voltage [V]	Current [A]	Speed [RPM]	Input Power [W]	Output Power [W]	Torque [Ncm]	Efficiency ¹ [%]
24.8	62.0	5,684.8	1,537.6	1,332.9	223.9	86.69
24.8	64.0	5,645.0	1,587.2	1,368.5	231.5	86.22
24.8	66.0	5,605.2	1,636.8	1,403.5	239.1	85.74
24.8	68.0	5,565.4	1,686.4	1,438.4	246.8	85.29
24.8	70.0	5,525.6	1,736.0	1,472.1	254.4	84.80
24.7	72.0	5,485.8	1,778.4	1,505.7	262.1	84.67
24.7	74.0	5,446.0	1,827.8	1,538.1	269.7	84.15
24.7	76.0	5,406.2	1,877.2	1,570.5	277.4	83.66
24.7	78.0	5,366.4	1,926.6	1,601.6	285.0	83.13
24.7	80.0	5,326.6	1,976.0	1,632.1	292.6	82.60
24.7	82.0	5,286.8	2,025.4	1,662.6	300.3	82.09
24.7	84.0	5,247.0	2,074.8	1,691.8	307.9	81.54
24.7	86.0	5,207.2	2,124.2	1,721.0	315.6	81.02
24.7	88.0	5,167.4	2,173.6	1,748.9	323.2	80.46
24.7	90.0	5,127.6	2,223.0	1,776.3	330.8	79.90
24.7	92.0	5,087.8	2,272.4	1,803.5	338.5	79.37
24.7	94.0	5,048.0	2,321.8	1,829.6	346.1	78.80
24.7	96.0	5,008.1	2,371.2	1,855.5	353.8	78.25
24.7	98.0	4,968.3	2,420.6	1,880.3	361.4	77.68
24.6	100.0	4,928.5	2,460.0	1,905.0	369.1	77.44
24.6	102.0	4,888.7	2,509.2	1,928.5	376.7	76.86
24.6	104.0	4,848.9	2,558.4	1,951.4	384.3	76.27
24.6	106.0	4,809.1	2,607.6	1,974.1	392.0	75.71
24.6	108.0	4,769.3	2,656.8	1,995.8	399.6	75.12
24.6	110.0	4,729.5	2,706.0	2,017.2	407.3	74.55

nl = rpm with no load

lo = current with no load

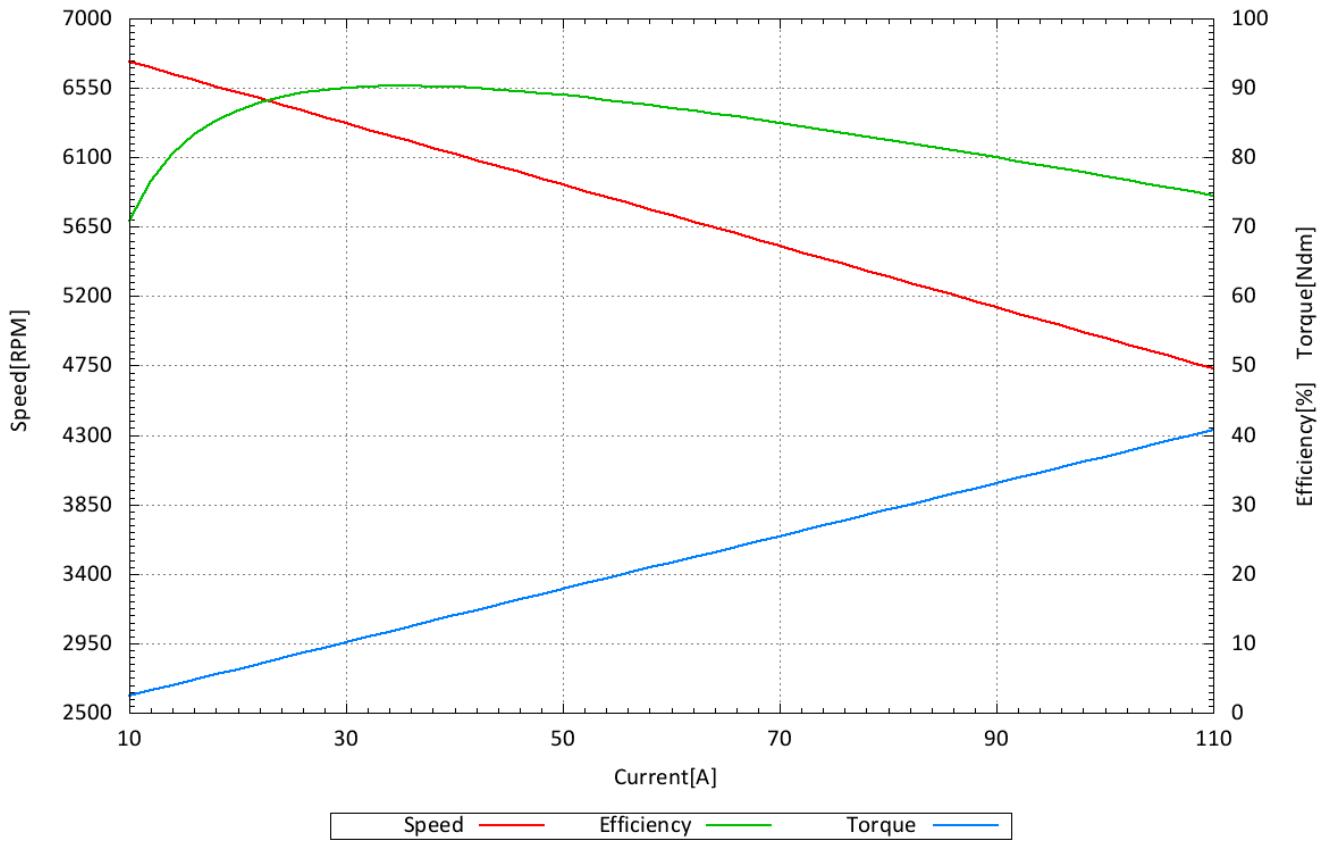
kV = specific rpm

kn = rpm drop per Amp

kT = torque constant

¹ incl. Controller

HP430_30_B8_P20_25V_08042024



Report calculated on Test Bench Results

Motor type: **NOVA 4-30-B8 P20**

Date: 08.04.2024

Bearing type: regular

Controller: Common ESC

Measuring Parameter

Voltage: **30.0 [V]**

Throttle setting: 100%

Calculated Motor Constants

nl: 8,263.0 [RPM] lo: 3.5 [A] kv: 278.1 [RPM/V] kn: -22.79 [RPM/A] kT: 3.85 [Ncm/A]

Voltage [V]	Current [A]	Speed [RPM]	Input Power [W]	Output Power [W]	Torque [Ncm]	Efficiency ¹ [%]
30.0	10.0	8,115.7	300.0	211.6	24.9	70.54
30.0	12.0	8,070.1	360.0	274.7	32.5	76.29
30.0	14.0	8,024.5	420.0	337.8	40.2	80.43
30.0	16.0	7,979.0	480.0	400.2	47.9	83.38
29.9	18.0	7,933.4	538.2	461.9	55.6	85.83
29.9	20.0	7,887.8	598.0	522.9	63.3	87.44
29.9	22.0	7,842.3	657.8	583.1	71.0	88.64
29.9	24.0	7,796.7	717.6	642.6	78.7	89.54
29.9	26.0	7,751.1	777.4	701.3	86.4	90.21
29.9	28.0	7,705.6	837.2	759.3	94.1	90.70
29.9	30.0	7,660.0	897.0	816.6	101.8	91.04
29.9	32.0	7,614.4	956.8	873.1	109.5	91.26
29.9	34.0	7,568.8	1,016.6	928.1	117.1	91.30
29.9	36.0	7,523.3	1,076.4	983.2	124.8	91.34
29.9	38.0	7,477.7	1,136.2	1,037.6	132.5	91.32
29.9	40.0	7,432.1	1,196.0	1,091.2	140.2	91.23
29.9	42.0	7,386.6	1,255.8	1,144.0	147.9	91.10
29.9	44.0	7,341.0	1,315.6	1,196.2	155.6	90.92
29.9	46.0	7,295.4	1,375.4	1,247.6	163.3	90.71
29.9	48.0	7,249.9	1,435.2	1,298.2	171.0	90.46
29.8	50.0	7,204.3	1,490.0	1,348.2	178.7	90.48
29.8	52.0	7,158.7	1,549.6	1,397.4	186.4	90.18
29.8	54.0	7,113.1	1,609.2	1,445.8	194.1	89.85
29.8	56.0	7,067.6	1,668.8	1,492.8	201.7	89.45
29.8	58.0	7,022.0	1,728.4	1,539.8	209.4	89.09
29.8	60.0	6,976.4	1,788.0	1,586.1	217.1	88.71

Voltage [V]	Current [A]	Speed [RPM]	Input Power [W]	Output Power [W]	Torque [Ncm]	Efficiency ¹ [%]
29.8	62.0	6,930.9	1,847.6	1,631.6	224.8	88.31
29.8	64.0	6,885.3	1,907.2	1,676.4	232.5	87.90
29.8	66.0	6,839.7	1,966.8	1,720.4	240.2	87.47
29.8	68.0	6,794.1	2,026.4	1,763.8	247.9	87.04
29.8	70.0	6,748.6	2,086.0	1,806.4	255.6	86.59
29.8	72.0	6,703.0	2,145.6	1,848.2	263.3	86.14
29.8	74.0	6,657.4	2,205.2	1,889.3	271.0	85.68
29.8	76.0	6,611.9	2,264.8	1,929.7	278.7	85.20
29.8	78.0	6,566.3	2,324.4	1,968.7	286.3	84.70
29.8	80.0	6,520.7	2,384.0	2,007.6	294.0	84.21
29.7	82.0	6,475.2	2,435.4	2,045.8	301.7	84.00
29.7	84.0	6,429.6	2,494.8	2,083.2	309.4	83.50
29.7	86.0	6,384.0	2,554.2	2,119.9	317.1	83.00
29.7	88.0	6,338.4	2,613.6	2,155.9	324.8	82.49
29.7	90.0	6,292.9	2,673.0	2,191.1	332.5	81.97
29.7	92.0	6,247.3	2,732.4	2,225.6	340.2	81.45
29.7	94.0	6,201.7	2,791.8	2,259.4	347.9	80.93
29.7	96.0	6,156.2	2,851.2	2,292.5	355.6	80.40
29.7	98.0	6,110.6	2,910.6	2,324.8	363.3	79.87
29.7	100.0	6,065.0	2,970.0	2,355.7	370.9	79.32
29.7	102.0	6,019.5	3,029.4	2,386.5	378.6	78.78
29.7	104.0	5,973.9	3,088.8	2,416.6	386.3	78.24
29.7	106.0	5,928.3	3,148.2	2,446.0	394.0	77.69
29.7	108.0	5,882.7	3,207.6	2,474.6	401.7	77.15
29.7	110.0	5,837.2	3,267.0	2,502.5	409.4	76.60

nl = rpm with no load

lo = current with no load

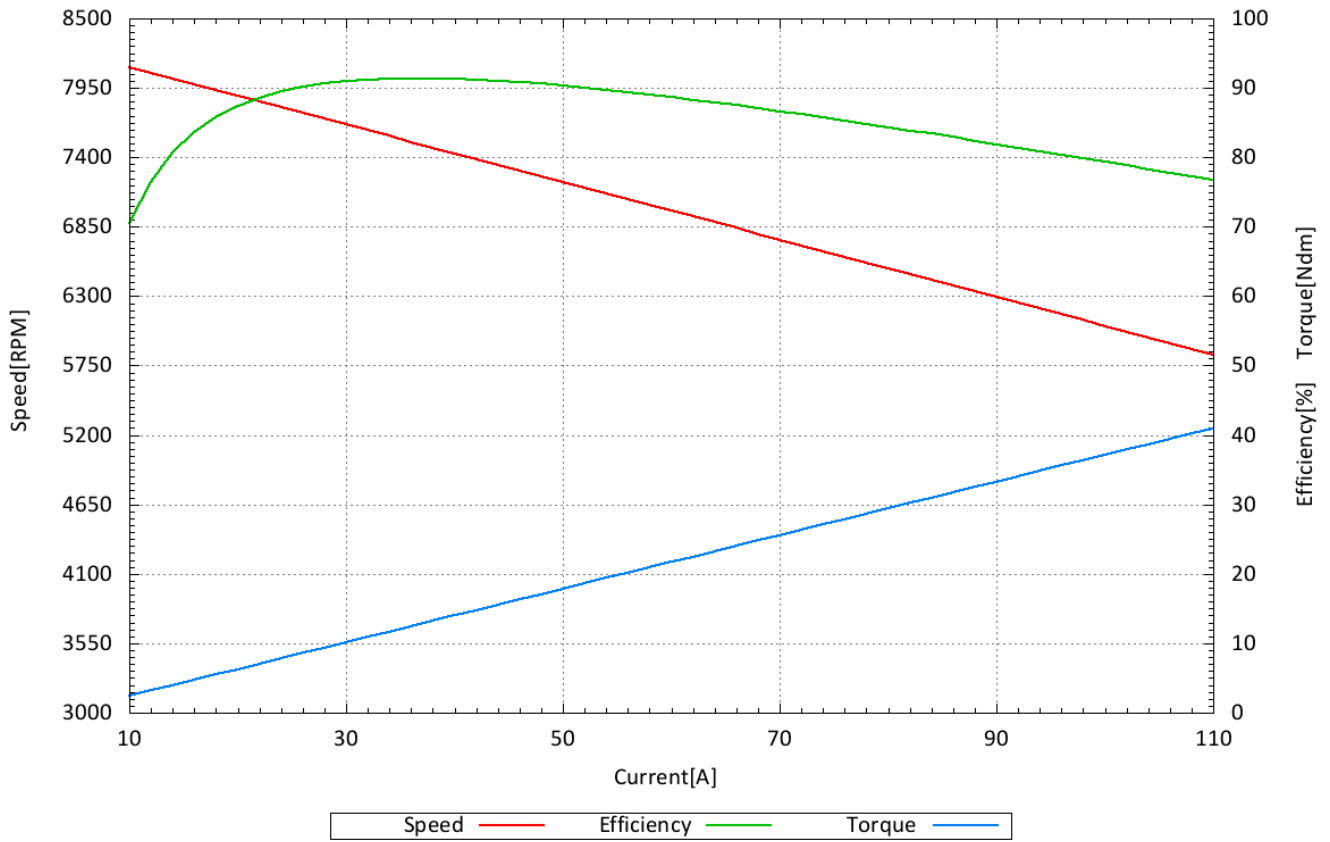
kV = specific rpm

kn = rpm drop per Amp

kT = torque constant

¹ incl. Controller

HP430_30_B8_P20_30V_08042024



Report calculated on Test Bench Results

Motor type: **NOVA 4-30-B8 P20**

Date: 12.04.2024

Bearing type: regular

Controller: Common ESC

Measuring Parameter

Voltage: **36.0 [V]**

Throttle setting: 100%

Calculated Motor Constants

nl: 9,893.4 [RPM] lo: 3.5 [A] kv: 277.2 [RPM/V] kn: -25.16 [RPM/A] kT: 3.83 [Ncm/A]

Voltage [V]	Current [A]	Speed [RPM]	Input Power [W]	Output Power [W]	Torque [Ncm]	Efficiency ¹ [%]
36.0	10.0	9,729.0	360.0	254.7	25.0	70.75
36.0	12.0	9,678.7	432.0	331.4	32.7	76.72
36.0	14.0	9,628.4	504.0	406.3	40.3	80.62
35.9	16.0	9,578.1	574.4	481.4	48.0	83.82
35.9	18.0	9,527.8	646.2	554.7	55.6	85.85
35.9	20.0	9,477.5	718.0	628.2	63.3	87.50
35.9	22.0	9,427.1	789.8	700.9	71.0	88.75
35.9	24.0	9,376.8	861.6	771.8	78.6	89.58
35.9	26.0	9,326.5	933.4	842.9	86.3	90.30
35.9	28.0	9,276.2	1,005.2	912.1	93.9	90.74
35.9	30.0	9,225.9	1,077.0	981.6	101.6	91.14
35.9	32.0	9,175.5	1,148.8	1,049.3	109.2	91.33
35.9	34.0	9,125.2	1,220.6	1,117.1	116.9	91.52
35.9	36.0	9,074.9	1,292.4	1,184.1	124.6	91.62
35.9	38.0	9,024.6	1,364.2	1,249.4	132.2	91.58
35.9	40.0	8,974.3	1,436.0	1,314.8	139.9	91.56
35.9	42.0	8,924.0	1,507.8	1,378.4	147.5	91.42
35.8	44.0	8,873.6	1,575.2	1,442.2	155.2	91.56
35.8	46.0	8,823.3	1,646.8	1,504.2	162.8	91.34
35.8	48.0	8,773.0	1,718.4	1,566.4	170.5	91.15
35.8	50.0	8,722.7	1,790.0	1,627.7	178.2	90.94
35.8	52.0	8,672.4	1,861.6	1,687.4	185.8	90.64
35.8	54.0	8,622.1	1,933.2	1,747.1	193.5	90.37
35.8	56.0	8,571.7	2,004.8	1,805.1	201.1	90.04
35.8	58.0	8,521.4	2,076.4	1,863.2	208.8	89.73
35.8	60.0	8,471.1	2,148.0	1,919.7	216.4	89.37

Voltage [V]	Current [A]	Speed [RPM]	Input Power [W]	Output Power [W]	Torque [Ncm]	Efficiency ¹ [%]
35.8	62.0	8,420.8	2,219.6	1,976.2	224.1	89.03
35.8	64.0	8,370.5	2,291.2	2,031.9	231.8	88.68
35.8	66.0	8,320.2	2,362.8	2,085.9	239.4	88.28
35.8	68.0	8,269.8	2,434.4	2,139.9	247.1	87.90
35.8	70.0	8,219.5	2,506.0	2,192.3	254.7	87.48
35.8	72.0	8,169.2	2,577.6	2,244.8	262.4	87.09
35.7	74.0	8,118.9	2,641.8	2,295.6	270.0	86.89
35.7	76.0	8,068.6	2,713.2	2,346.4	277.7	86.48
35.7	78.0	8,018.3	2,784.6	2,396.4	285.4	86.06
35.7	80.0	7,967.9	2,856.0	2,444.8	293.0	85.60
35.7	82.0	7,917.6	2,927.4	2,493.2	300.7	85.17
35.7	84.0	7,867.3	2,998.8	2,540.0	308.3	84.70
35.7	86.0	7,817.0	3,070.2	2,586.8	316.0	84.25
35.7	88.0	7,766.7	3,141.6	2,632.7	323.7	83.80
35.7	90.0	7,716.4	3,213.0	2,677.1	331.3	83.32
35.7	92.0	7,666.0	3,284.4	2,721.4	339.0	82.86
35.7	94.0	7,615.7	3,355.8	2,764.2	346.6	82.37
35.7	96.0	7,565.4	3,427.2	2,806.9	354.3	81.90
35.7	98.0	7,515.1	3,498.6	2,848.1	361.9	81.41
35.7	100.0	7,464.8	3,570.0	2,889.2	369.6	80.93
35.6	102.0	7,414.4	3,631.2	2,929.5	377.3	80.68
35.6	104.0	7,364.1	3,702.4	2,968.2	384.9	80.17
35.6	106.0	7,313.8	3,773.6	3,006.9	392.6	79.68
35.6	108.0	7,263.5	3,844.8	3,044.0	400.2	79.17
35.6	110.0	7,213.2	3,916.0	3,081.1	407.9	78.68

nl = rpm with no load

lo = current with no load

kV = specific rpm

kn = rpm drop per Amp

kT = torque constant

¹ incl. Controller

HP430_30_B8_P20_36V_12042024

