# Test Bench Measurement

| | |
|---|---|
| Motor type: | **HP 875-50-A8 S P30** |
| Date: | 17.02.2021 |
| Bearing type: | RS |
| Controller: | MST 400-133 |

## Measuring Parameter

Voltage: **290.0 [V]**

Throttle setting: 100%

## Calculated Motor Constants

nl: 9,060.4 [RPM]    Io: 3.5 [A]    kV: 31.7 [RPM/V]    kn: -39.69 [RPM/A]  kT: 36.60 [Ncm/A]

| Voltage | Current | Speed | Input Power | Output Power | Torque | Efficiency[1] |
|---|---|---|---|---|---|---|
| [V] | [A] | [RPM] | [W] | [W] | [Ncm] | [%] |
| 290.2 | 5.0 | 9,132.7 | 1,451.0 | 941.1 | 98.4 | 64.86 |
| 290.2 | 6.0 | 9,075.0 | 1,741.2 | 1,226.9 | 129.1 | 70.46 |
| 290.2 | 7.0 | 9,018.3 | 2,031.4 | 1,512.0 | 160.1 | 74.43 |
| 290.2 | 8.0 | 8,962.4 | 2,321.6 | 1,797.3 | 191.5 | 77.42 |
| 290.2 | 9.0 | 8,907.4 | 2,611.8 | 2,081.0 | 223.1 | 79.68 |
| 290.2 | 10.0 | 8,853.3 | 2,902.0 | 2,365.1 | 255.1 | 81.50 |
| 290.2 | 11.0 | 8,800.0 | 3,192.2 | 2,648.5 | 287.4 | 82.97 |
| 290.2 | 12.0 | 8,747.5 | 3,482.4 | 2,931.3 | 320.0 | 84.18 |
| 290.2 | 13.0 | 8,696.0 | 3,772.6 | 3,213.7 | 352.9 | 85.18 |
| 290.2 | 14.0 | 8,645.2 | 4,062.8 | 3,495.5 | 386.1 | 86.04 |
| 290.1 | 15.0 | 8,595.2 | 4,351.5 | 3,775.9 | 419.5 | 86.77 |
| 290.1 | 16.0 | 8,546.1 | 4,641.6 | 4,056.8 | 453.3 | 87.40 |
| 290.1 | 17.0 | 8,497.8 | 4,931.7 | 4,336.4 | 487.3 | 87.93 |
| 290.1 | 18.0 | 8,450.2 | 5,221.8 | 4,615.7 | 521.6 | 88.39 |
| 290.1 | 19.0 | 8,403.5 | 5,511.9 | 4,893.7 | 556.1 | 88.79 |
| 290.1 | 20.0 | 8,357.5 | 5,802.0 | 5,171.5 | 590.9 | 89.13 |
| 290.1 | 21.0 | 8,312.3 | 6,092.1 | 5,448.2 | 625.9 | 89.43 |
| 290.1 | 22.0 | 8,267.8 | 6,382.2 | 5,724.7 | 661.2 | 89.70 |
| 290.1 | 23.0 | 8,224.1 | 6,672.3 | 6,001.0 | 696.8 | 89.94 |
| 290.1 | 24.0 | 8,181.1 | 6,962.4 | 6,275.5 | 732.5 | 90.13 |
| 290.1 | 25.0 | 8,138.8 | 7,252.5 | 6,549.9 | 768.5 | 90.31 |
| 290.1 | 26.0 | 8,097.3 | 7,542.6 | 6,824.3 | 804.8 | 90.48 |
| 290.1 | 27.0 | 8,056.5 | 7,832.7 | 7,097.0 | 841.2 | 90.61 |
| 290.1 | 28.0 | 8,016.3 | 8,122.8 | 7,368.8 | 877.8 | 90.72 |
| 290.1 | 29.0 | 7,976.9 | 8,412.9 | 7,640.8 | 914.7 | 90.82 |
| 290.1 | 30.0 | 7,938.2 | 8,703.0 | 7,911.4 | 951.7 | 90.90 |

| Voltage | Current | Speed | Input Power | Output Power | Torque | Efficiency[1] |
|---|---|---|---|---|---|---|
| [V] | [A] | [RPM] | [W] | [W] | [Ncm] | [%] |
| 290.0 | 32.0 | 7,862.7 | 9,280.0 | 8,451.2 | 1,026.4 | 91.07 |
| 290.0 | 33.0 | 7,825.9 | 9,570.0 | 8,719.8 | 1,064.0 | 91.12 |
| 290.0 | 34.0 | 7,789.8 | 9,860.0 | 8,987.9 | 1,101.8 | 91.16 |
| 290.0 | 35.0 | 7,754.3 | 10,150.0 | 9,255.5 | 1,139.8 | 91.19 |
| 290.0 | 36.0 | 7,719.4 | 10,440.0 | 9,521.8 | 1,177.9 | 91.21 |
| 290.0 | 37.0 | 7,685.2 | 10,730.0 | 9,787.9 | 1,216.2 | 91.22 |
| 290.0 | 38.0 | 7,651.6 | 11,020.0 | 10,053.6 | 1,254.7 | 91.23 |
| 290.0 | 39.0 | 7,618.5 | 11,310.0 | 10,318.0 | 1,293.3 | 91.23 |
| 290.0 | 40.0 | 7,586.1 | 11,600.0 | 10,581.6 | 1,332.0 | 91.22 |
| 290.0 | 41.0 | 7,554.3 | 11,890.0 | 10,845.0 | 1,370.9 | 91.21 |
| 290.0 | 42.0 | 7,523.0 | 12,180.0 | 11,107.3 | 1,409.9 | 91.19 |
| 290.0 | 43.0 | 7,492.2 | 12,470.0 | 11,369.4 | 1,449.1 | 91.17 |
| 290.0 | 44.0 | 7,462.1 | 12,760.0 | 11,630.0 | 1,488.3 | 91.14 |
| 290.0 | 45.0 | 7,432.5 | 13,050.0 | 11,890.5 | 1,527.7 | 91.12 |
| 290.0 | 46.0 | 7,403.4 | 13,340.0 | 12,150.2 | 1,567.2 | 91.08 |
| 290.0 | 47.0 | 7,374.8 | 13,630.0 | 12,409.1 | 1,606.8 | 91.04 |
| 289.9 | 48.0 | 7,346.8 | 13,915.2 | 12,667.4 | 1,646.5 | 91.03 |
| 289.9 | 49.0 | 7,319.2 | 14,205.1 | 12,924.9 | 1,686.3 | 90.99 |
| 289.9 | 50.0 | 7,292.2 | 14,495.0 | 13,181.9 | 1,726.2 | 90.94 |
| 289.9 | 51.0 | 7,265.7 | 14,784.9 | 13,437.6 | 1,766.1 | 90.89 |
| 289.9 | 52.0 | 7,239.6 | 15,074.8 | 13,693.3 | 1,806.2 | 90.84 |
| 289.9 | 53.0 | 7,214.0 | 15,364.7 | 13,947.8 | 1,846.3 | 90.78 |
| 289.9 | 54.0 | 7,188.9 | 15,654.6 | 14,201.9 | 1,886.5 | 90.72 |
| 289.9 | 55.0 | 7,164.2 | 15,944.5 | 14,454.7 | 1,926.7 | 90.66 |
| 289.9 | 56.0 | 7,140.0 | 16,234.4 | 14,707.2 | 1,967.0 | 90.59 |
| 289.9 | 57.0 | 7,116.2 | 16,524.3 | 14,958.5 | 2,007.3 | 90.52 |
| 289.9 | 58.0 | 7,092.8 | 16,814.2 | 15,209.4 | 2,047.7 | 90.46 |
| 289.9 | 59.0 | 7,069.8 | 17,104.1 | 15,459.2 | 2,088.1 | 90.38 |
| 289.9 | 60.0 | 7,047.3 | 17,394.0 | 15,708.9 | 2,128.6 | 90.31 |
| 289.9 | 61.0 | 7,025.1 | 17,683.9 | 15,957.3 | 2,169.1 | 90.24 |
| 289.9 | 62.0 | 7,003.4 | 17,973.8 | 16,205.1 | 2,209.6 | 90.16 |
| 289.9 | 63.0 | 6,982.0 | 18,263.7 | 16,451.7 | 2,250.1 | 90.08 |
| 289.8 | 64.0 | 6,961.0 | 18,547.2 | 16,697.4 | 2,290.6 | 90.03 |
| 289.8 | 65.0 | 6,940.3 | 18,837.0 | 16,942.1 | 2,331.1 | 89.94 |
| 289.8 | 66.0 | 6,920.0 | 19,126.8 | 17,186.8 | 2,371.7 | 89.86 |
| 289.8 | 67.0 | 6,900.1 | 19,416.6 | 17,430.0 | 2,412.2 | 89.77 |
| 289.8 | 68.0 | 6,880.5 | 19,706.4 | 17,672.3 | 2,452.7 | 89.68 |
| 289.8 | 69.0 | 6,861.2 | 19,996.2 | 17,913.7 | 2,493.2 | 89.59 |
| 289.8 | 70.0 | 6,842.2 | 20,286.0 | 18,154.3 | 2,533.7 | 89.49 |

| Voltage | Current | Speed | Input Power | Output Power | Torque | Efficiency[1] |
|---|---|---|---|---|---|---|
| [V] | [A] | [RPM] | [W] | [W] | [Ncm] | [%] |
| 289.8 | 72.0 | 6,805.1 | 20,865.6 | 18,631.7 | 2,614.5 | 89.29 |
| 289.8 | 73.0 | 6,787.1 | 21,155.4 | 18,869.5 | 2,654.9 | 89.19 |
| 289.8 | 74.0 | 6,769.2 | 21,445.2 | 19,105.4 | 2,695.2 | 89.09 |
| 289.8 | 75.0 | 6,751.7 | 21,735.0 | 19,341.0 | 2,735.5 | 88.99 |

nl = rpm with no load

Io = current with no load

kV = specific rpm

kn = rpm drop per Amp

kT = torque constant

[1] incl. Controller