

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: **170.0 [V]**

Throttle setting: 100%

Calculated Motor Constants

nl: 5,358.8 [RPM] lo: 3.2 [A] kV: 32.0 [RPM/V] kn: -25.81 [RPM/A] kT: 36.55 [Ncm/A]

| Voltage [V] | Current [A] | Speed [RPM] | Input Power [W] | Output Power [W] | Torque [Ncm] | Efficiency ¹ [%] |
|----------------|----------------|----------------|--------------------|---------------------|-----------------|--------------------------------|
| 170.2 | 5.0 | 5,393.4 | 851.0 | 611.1 | 108.2 | 71.81 |
| 170.2 | 6.0 | 5,356.6 | 1,021.2 | 774.7 | 138.1 | 75.86 |
| 170.2 | 7.0 | 5,320.4 | 1,191.4 | 938.2 | 168.4 | 78.75 |
| 170.2 | 8.0 | 5,284.7 | 1,361.6 | 1,102.4 | 199.2 | 80.96 |
| 170.1 | 9.0 | 5,249.6 | 1,530.9 | 1,267.1 | 230.5 | 82.77 |
| 170.1 | 10.0 | 5,215.0 | 1,701.0 | 1,431.9 | 262.2 | 84.18 |
| 170.1 | 11.0 | 5,180.9 | 1,871.1 | 1,596.7 | 294.3 | 85.33 |
| 170.1 | 12.0 | 5,147.3 | 2,041.2 | 1,761.5 | 326.8 | 86.30 |
| 170.1 | 13.0 | 5,114.2 | 2,211.3 | 1,926.4 | 359.7 | 87.12 |
| 170.1 | 14.0 | 5,081.6 | 2,381.4 | 2,091.3 | 393.0 | 87.82 |
| 170.1 | 15.0 | 5,049.6 | 2,551.5 | 2,255.8 | 426.6 | 88.41 |
| 170.1 | 16.0 | 5,018.0 | 2,721.6 | 2,420.4 | 460.6 | 88.93 |
| 170.1 | 17.0 | 4,986.9 | 2,891.7 | 2,584.5 | 494.9 | 89.38 |
| 170.1 | 18.0 | 4,956.4 | 3,061.8 | 2,748.8 | 529.6 | 89.78 |
| 170.1 | 19.0 | 4,926.2 | 3,231.9 | 2,912.1 | 564.5 | 90.10 |
| 170.1 | 20.0 | 4,896.6 | 3,402.0 | 3,075.6 | 599.8 | 90.41 |
| 170.1 | 21.0 | 4,867.4 | 3,572.1 | 3,238.2 | 635.3 | 90.65 |
| 170.1 | 22.0 | 4,838.7 | 3,742.2 | 3,400.5 | 671.1 | 90.87 |
| 170.1 | 23.0 | 4,810.5 | 3,912.3 | 3,562.6 | 707.2 | 91.06 |
| 170.1 | 24.0 | 4,782.7 | 4,082.4 | 3,723.8 | 743.5 | 91.22 |
| 170.1 | 25.0 | 4,755.4 | 4,252.5 | 3,884.3 | 780.0 | 91.34 |
| 170.1 | 26.0 | 4,728.5 | 4,422.6 | 4,044.0 | 816.7 | 91.44 |
| 170.0 | 27.0 | 4,702.0 | 4,590.0 | 4,203.6 | 853.7 | 91.58 |
| 170.0 | 28.0 | 4,676.0 | 4,760.0 | 4,362.0 | 890.8 | 91.64 |
| 170.0 | 29.0 | 4,650.4 | 4,930.0 | 4,519.7 | 928.1 | 91.68 |
| 170.0 | 30.0 | 4,625.2 | 5,100.0 | 4,676.4 | 965.5 | 91.69 |

| Voltage | Current | Speed | Input Power | Output Power | Torque | Efficiency ¹ |
|---------|---------|---------|-------------|--------------|---------|-------------------------|
| [V] | [A] | [RPM] | [W] | [W] | [Ncm] | [%] |
| 170.0 | 32.0 | 4,576.1 | 5,440.0 | 4,988.1 | 1,040.9 | 91.69 |
| 170.0 | 33.0 | 4,552.1 | 5,610.0 | 5,142.1 | 1,078.7 | 91.66 |
| 170.0 | 34.0 | 4,528.6 | 5,780.0 | 5,295.8 | 1,116.7 | 91.62 |
| 170.0 | 35.0 | 4,505.4 | 5,950.0 | 5,448.4 | 1,154.8 | 91.57 |
| 170.0 | 36.0 | 4,482.6 | 6,120.0 | 5,599.7 | 1,192.9 | 91.50 |
| 170.0 | 37.0 | 4,460.3 | 6,290.0 | 5,750.2 | 1,231.1 | 91.42 |
| 170.0 | 38.0 | 4,438.3 | 6,460.0 | 5,899.9 | 1,269.4 | 91.33 |
| 170.0 | 39.0 | 4,416.6 | 6,630.0 | 6,047.7 | 1,307.6 | 91.22 |
| 170.0 | 40.0 | 4,395.4 | 6,800.0 | 6,195.4 | 1,346.0 | 91.11 |
| 170.0 | 41.0 | 4,374.5 | 6,970.0 | 6,341.4 | 1,384.3 | 90.98 |
| 170.0 | 42.0 | 4,354.0 | 7,140.0 | 6,486.3 | 1,422.6 | 90.85 |
| 170.0 | 43.0 | 4,333.8 | 7,310.0 | 6,630.1 | 1,460.9 | 90.70 |
| 169.9 | 44.0 | 4,313.9 | 7,475.6 | 6,772.6 | 1,499.2 | 90.60 |
| 169.9 | 45.0 | 4,294.4 | 7,645.5 | 6,913.8 | 1,537.4 | 90.43 |
| 169.9 | 46.0 | 4,275.3 | 7,815.4 | 7,054.1 | 1,575.6 | 90.26 |
| 169.9 | 47.0 | 4,256.5 | 7,985.3 | 7,192.9 | 1,613.7 | 90.08 |
| 169.9 | 48.0 | 4,238.0 | 8,155.2 | 7,330.3 | 1,651.7 | 89.88 |
| 169.9 | 49.0 | 4,219.8 | 8,325.1 | 7,466.7 | 1,689.7 | 89.69 |
| 169.9 | 50.0 | 4,201.9 | 8,495.0 | 7,601.4 | 1,727.5 | 89.48 |
| 169.9 | 51.0 | 4,184.4 | 8,664.9 | 7,734.9 | 1,765.2 | 89.27 |
| 169.9 | 52.0 | 4,167.2 | 8,834.8 | 7,866.8 | 1,802.7 | 89.04 |
| 169.9 | 53.0 | 4,150.2 | 9,004.7 | 7,997.2 | 1,840.1 | 88.81 |
| 169.9 | 54.0 | 4,133.6 | 9,174.6 | 8,126.7 | 1,877.4 | 88.58 |
| 169.9 | 55.0 | 4,117.2 | 9,344.5 | 8,254.0 | 1,914.4 | 88.33 |
| 169.9 | 56.0 | 4,101.1 | 9,514.4 | 8,380.2 | 1,951.3 | 88.08 |
| 169.9 | 57.0 | 4,085.3 | 9,684.3 | 8,504.9 | 1,988.0 | 87.82 |
| 169.9 | 58.0 | 4,069.8 | 9,854.2 | 8,627.8 | 2,024.4 | 87.55 |
| 169.9 | 59.0 | 4,054.6 | 10,024.1 | 8,749.2 | 2,060.6 | 87.28 |
| 169.9 | 60.0 | 4,039.6 | 10,194.0 | 8,869.2 | 2,096.6 | 87.00 |
| 169.8 | 61.0 | 4,024.9 | 10,357.8 | 8,987.4 | 2,132.3 | 86.77 |
| 169.8 | 62.0 | 4,010.4 | 10,527.6 | 9,103.6 | 2,167.7 | 86.47 |
| 169.8 | 63.0 | 3,996.2 | 10,697.4 | 9,218.7 | 2,202.9 | 86.18 |
| 169.8 | 64.0 | 3,982.2 | 10,867.2 | 9,331.5 | 2,237.7 | 85.87 |
| 169.8 | 65.0 | 3,968.4 | 11,037.0 | 9,443.0 | 2,272.3 | 85.56 |
| 169.8 | 66.0 | 3,954.9 | 11,206.8 | 9,552.5 | 2,306.5 | 85.24 |
| 169.8 | 67.0 | 3,941.6 | 11,376.6 | 9,659.9 | 2,340.3 | 84.91 |
| 169.8 | 68.0 | 3,928.5 | 11,546.4 | 9,765.6 | 2,373.8 | 84.58 |
| 169.8 | 69.0 | 3,915.7 | 11,716.2 | 9,869.9 | 2,407.0 | 84.24 |
| 169.8 | 70.0 | 3,903.0 | 11,886.0 | 9,971.6 | 2,439.7 | 83.89 |

| Voltage | Current | Speed | Input Power | Output Power | Torque | Efficiency ¹ |
|---------|---------|---------|-------------|--------------|---------|-------------------------|
| [V] | [A] | [RPM] | [W] | [W] | [Ncm] | [%] |
| 169.8 | 72.0 | 3,878.4 | 12,225.6 | 10,170.3 | 2,504.1 | 83.19 |
| 169.8 | 73.0 | 3,866.3 | 12,395.4 | 10,266.1 | 2,535.6 | 82.82 |
| 169.8 | 74.0 | 3,854.5 | 12,565.2 | 10,360.3 | 2,566.7 | 82.45 |
| 169.8 | 75.0 | 3,842.8 | 12,735.0 | 10,452.4 | 2,597.4 | 82.08 |

nl = rpm with no load

lo = current with no load

kV = specific rpm

kn = rpm drop per Amp

kT = torque constant

¹ incl. Controller