AC Inverter-Duty Motors

1000:1 Constant Torque (TENV), 20:1 Constant Torque (TEFC)



Features

- Constant torque operation from 0 to base speed (TENV ratings)
- Constant torque operation from 1/20 speed to base speed (TEFC ratings)
- Constant horsepower to twice base speed (rpm)
- Class H insulation with CR200 (corona-resistant) magnet wire
- Continuous duty at 40°C ambient
- C-Face with rigid base, except C-Face with removable rigid base as noted
- Service Factor: 1.0
- Utilizes double shielded ball bearings
- Exxon Polyrex® EM bearing grease
- Eliminates brush and commutator maintenance
- Electrically reversible
- UL Recognized, CSA Certified, and CE Mark
- Three year warranty

Applications

- Replaces 90 volt and 180 volt PMDC motors (when used with AC variable frequency drives)
- Typical uses include: machine tools, conveyors, packaging machines, batching machines, printing equipment, pumps and fans.

Motor Shipping Schedule *		
*Same or one day **	*Up to 7 days*	*Up to 10 days*

Color indicates shipping lead time in business days. Check stock status online.
*** Certain heavy and oversized items can be shipped only via LTL. Check our website for current shipping method constraints by part number.**

Motor Specifications

Part Number *	Price	hp	Base rpm	Volts	Encl.	NEMA Frame	Model No.	F.L. Amps	Weight (lb) *	Footnotes	Drawing Links
Y500	$316.00	1/4	1800	230	TENV	56C	56H17T2011	1.0	17	Q	PDF
Y502	$339.00	1/3					56H17T2013A	1.2	17	Q	PDF
Y360	$400.00	1/2		230/460			56H17T2017	1.8 / 0.9	25	–	PDF
Y362	$493.00	3/4			TEFC		56H17F2017A	2.8 / 1.4	25	–	PDF
Y364	$555.00	1					56H17F2021	3.2 / 1.6	28	–	PDF
Y366	$690.00	1-1/2			TENV	145TC	145THTR5329AA	4.8 / 2.4	45	6	PDF
Y368	$915.00	2			TEFC		145THFR5329	5.8 / 2.9	45	6	PDF

*** Refer to the Motor Shipping Schedule table for shipping information.**
Certain heavy and oversized items can be shipped only via LTL. Check our web site for current shipping method constraints by part number.
Footnotes: Q = "Quick Connect" terminal board (1/4-in female spade lug) 6 = Bolt-on, removable base for footless mounting option
Note: Please review the AutomationDirect Terms & Conditions for warranty and service on this product.

Performance Data (460 Volt except as indicated)

Part Number	hp	NEMA Design	F.L. rpm	Min. rpm	F.L. Amps @460V	N.L. Amps @460V	F.L. Torque (lb·ft)	B.D. Torque (lb·ft)	Max. CHP rpm*	Max. Safe rpm	F.L. Effic.	F.L. Power Factor	Rotor Inertia (lb·ft2)
Y500	1/4 (230V)	B	1725	1.8	1.0 (230V)	0.7 (230V)	0.75	3.7	3520	5400	72.0	65.0	0.040
Y502	1/3 (230V)	B	1725	1.8	1.2 (230V)	0.9 (230V)	1.0	4.5	3450	5400	74.0	67.0	0.045
Y360	1/2	B	1725	1.8	0.9	0.5	1.5	6.8	3520	5400	80.0	72.0	0.075
Y362	3/4	A	1725	90	1.4	1.0	2.3	9.5	3520	4000	75.5	70.5	0.055
Y364	1	B	1725	90	1.6	0.9	3.0	12.0	3520	4000	78.5	77.5	0.090
Y366	1-1/2	A	1755	1.8	2.4	1.6	4.5	29.0	3500	5400	85.5	69.0	0.140
Y368	2	B	1740	90	2.9	1.6	6.0	29.0	3530	4000	82.5	77.0	0.140

*** Maximum Constant hp rpm is for direct-coupled loads.**

microMAX™ AC Inverter-Duty Motors

1000:1 Constant Torque (TENV), 20:1 Constant Torque (TEFC)



Features

- Constant torque operation from 0 to base speed (TENV ratings)
- Constant torque operation from 1/20 speed to base speed (TEFC ratings)
- Constant horsepower to twice base speed (rpm)
- Class H insulation with CR200 (corona-resistant) magnet wire
- Continuous duty at 40°C ambient
- C-Face with rigid base, except C-Face with removable rigid base as noted
- Service Factor: 1.0
- Utilizes double shielded ball bearings
- Exxon Polyrex® EM bearing grease
- Eliminates brush and commutator maintenance
- Electrically reversible
- UL Recognized, CSA Certified, and CE Mark
- Three year warranty (through Marathon Electric)

Applications

- Replaces 90 volt and 180 volt PMDC motors (when used with AC variable frequency drives)
- Typical uses include: machine tools, conveyors, packaging machines, batching machines, printing equipment, pumps and fans.

Motor Shipping Schedule *		
Same or one day *	Up to 7 days	Up to 10 days

Color indicates shipping lead time in business days. Check stock status online.
* Certain heavy and oversized items can be shipped only via LTL. Check our website for current shipping method constraints by part number.

Motor Specifications – microMAX

Part Number *	Price	hp	Base rpm	Volts	Encl.	NEMA Frame	Model No.	F.L. Amps	Weight (lb) *	Footnotes	Drawing Links
Y1999	$1,105.00	3	1800	230/460	TEFC	182TC	182THFW7729AA	8.4 / 4.2	64	6	PDF
Y1372	$1,257.00	5				184TC	184THFW7726AA	13.0 / 6.5	92	6	PDF
Y994	$1,606.00	7-1/2				213TC	213THFW7726	21.4 / 10.7	125	6	PDF
Y996	$2,019.00	10				215TC	215THFW7726	27.6 / 13.8	135	6	PDF

* Refer to the Motor Shipping Schedule table for shipping information.
Certain heavy and oversized items can be shipped only via LTL. Check our web site for current shipping method constraints by part number.
Footnotes: Q = "Quick Connect" terminal board (1/4-in female spade lug) 6 = Bolt-on, removable base for footless mounting option
Note: Please review the AutomationDirect Terms & Conditions for warranty and service on this product. Warranty service can be arranged through numerous Marathon Electric service centers. See list of service centers on our Web site at www.automationdirect.com.

Performance Data (460 Volt except as indicated) – microMAX

Part Number	hp	NEMA Design	F.L. rpm	Min. rpm	F.L. Amps @460V	N.L. Amps @460V	F.L. Torque (lb·ft)	B.D. Torque (lb·ft)	Max. CHP rpm*	Max. Safe rpm	F.L. Effic.	F.L. Power Factor	Rotor Inertia (lb·ft2)
Y1999	3	A	1765	90	4.2	2.2	8.9	33.8	3530	4000	87.5	76.4	0.38
Y1372	5		1760	90	6.5	2.8	15	48.6	3520	4000	87.5	81.6	0.357
Y994	7-1/2		1770	90	10.7	6.2	22.3	80.0	3565	4000	89.5	72.5	0.75
Y996	10	B	1770	90	13.8	7.8	30.0	110	3570	4000	91.0	74.0	1.00

* Maximum Constant hp rpm is for direct-coupled loads.

LEESON®

AC Inverter-Duty Motors with Encoder

1000:1 Constant Torque (TENV)



Features

- Integrated Dynapar HS20 1024 ppr encoder
- Optimized for operation with IGBT inverter
- Constant Torque operation from 0 to base speed on Vector Drive
- Constant Horsepower operation up to twice base rpm
- Class F insulation with CR200 corona resistant magnet wire
- Continuous duty at 40°C ambient
- C-Face with rigid base, except C-Face with removable rigid base as noted
- Service Factor: 1.0
- Ball bearings
- F1 mounting (except as noted)
- UL Recognized, CSA Certified, and CE Mark
- Three year warranty

Applications

- Replaces 90 volt and 180 volt PMDC motors (when used with AC variable frequency drives)
- Typical uses include: machine tools, conveyors, packaging machines, batching machines, printing equipment, pumps and fans.

Motor Shipping Schedule *		
*Same or one day **	*Up to 7 days*	*Up to 10 days*

Color indicates shipping lead time in business days. Check stock status online.
*** Certain heavy and oversized items can be shipped only via LTL. Check our website for current shipping method constraints by part number.**

Prices & Specifications

Motor Specifications

Part Number *	Price	hp	Base rpm	Volts	Encl.	NEMA Frame	Model No.	F.L. Amps	Weight (lb) *	Footnotes	Drawing Links
Y280	$1,230.00	1/2	1800	230/460	TENV	56C	56H17T15526A	1.6 / 0.8	25	6	PDF
Y281	$1,287.00	3/4					56H17T15528A	2.4 / 1.2	35	6	PDF
Y282	$1,362.00	1					56H17T15527A	3.0 / 1.5	42	6	PDF
Y284	$1,622.00	1-1/2				145TC	145THTR15540AA	4.8 / 2.4	45	6	PDF
Y285	$2,176.00	2					145THTN17034AA	6.0 / 3.0	68	13b	PDF

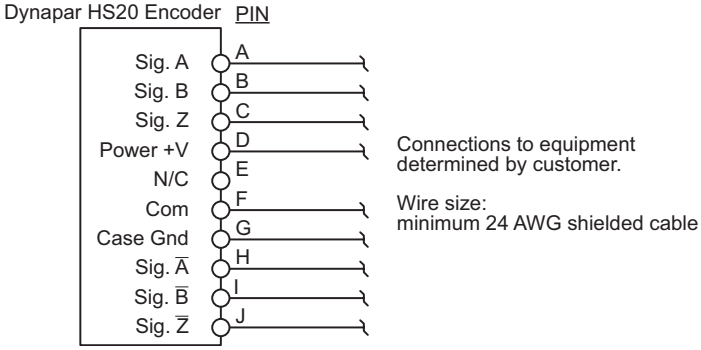
*** Refer to the Motor Shipping Schedule table for shipping information.**
Certain heavy and oversized items can be shipped only via LTL. Check our web site for current shipping method constraints by part number.
Footnotes: 6 = Bolt-on, removable base for footless mounting option 13b = Field reversible from F1 to F2 mounting
Note: Please review the AutomationDirect Terms & Conditions for warranty and service on this product.

Motors Shaft-Mounted Encoder*

A Dynapar Model HS20 shaft-mounted encoder is supplied with the motor. The 5/8-in hollow-shaft encoder requires a 5–26 VDC power source, provides a count of 1024 pulses per revolution (PPR), differential line driver output, and includes 10 screw-terminal wiring connections.

** The encoder cable gland accepts cable diameters from 0.187–0.30 in.*
** There is no manufacturer's published tightening torque for the encoder screw terminals.*

Encoder Wiring Connections



Connections to equipment determined by customer.

Wire size:
minimum 24 AWG shielded cable

AC Inverter-Duty Motors with Encoder

Performance Data

Performance Data (460 Volt)													
Part Number	*hp*	*NEMA Design*	*F.L. rpm*	*Min. rpm*	*F.L. Amps @460V*	*N.L. Amps @460V*	*F.L. Torque (lb·ft)*	*B.D. Torque (lb·ft)*	*Max. CHP rpm**	*Max. Safe rpm*	*F.L. Effic.*	*F.L. Power Factor*	*Rotor Inertia (lb·ft2)*
Y280	1/2	A	1725		0.8	0.5	1.5	5.8	3510		80.0	72.0	0.06
Y281	3/4	A	1725		1.2	0.8	2.3	10.2	3450		82.5	73.5	0.09
Y282	1	A	1725	0	1.5	1.0	3.0	15.0	3505	5400	84.0	75.0	0.11
Y284	1-1/2	B	1755		2.4	1.6	4.5	29.0	3500		85.5	69.0	0.14
Y285	2	B	1750		3.0	1.7	6.0	28.5	3525		85.5	78.0	0.13

*** Maximum Constant hp rpm is for direct coupled loads.**

marathon® Motors

microMAX™ AC Inverter-Duty Motors with Encoder

1000:1 Constant Torque (TENV)



Features

- Integrated Dynapar HS20 1024 ppr encoder
- Optimized for operation with IGBT inverter
- Constant Torque operation from 0 to base speed on Vector Drive
- Constant Horsepower operation up to twice base rpm
- Class F insulation with CR200 corona resistant magnet wire
- Continuous duty at 40°C ambient
- C-Face with rigid base, except C-Face with removable rigid base as noted
- Service Factor: 1.0
- Ball bearings
- F1 mounting (except as noted)
- UL Recognized, CSA Certified, and CE Mark
- Three year warranty (through Marathon Electric)

Applications

- Replaces 90 volt and 180 volt PMDC motors (when used with AC variable frequency drives)
- Typical uses include: machine tools, conveyors, packaging machines, batching machines, printing equipment, pumps and fans.

Motor Shipping Schedule *		
*Same or one day **	*Up to 7 days*	*Up to 10 days*

Color indicates shipping lead time in business days. Check stock status online.
*** Certain heavy and oversized items can be shipped only via LTL. Check our website for current shipping method constraints by part number.**

Prices & Specifications

Motor Specifications – microMAX (with encoder)

Part Number *	Price	hp	Base rpm	Volts	Encl.	NEMA Frame	Model No.	F.L. Amps	Weight (lb) *	Footnotes	Drawing Links
Y286A	$2,397.00	3	1800	230/460	TENV	182TC	182THTY17041AA	8.2 / 4.1	110	13b	PDF

*** Refer to the Motor Shipping Schedule table for shipping information.**
Certain heavy and oversized items can be shipped only via LTL. Check our web site for current shipping method constraints by part number.
Footnotes: 6 = Bolt-on, removable base for footless mounting option 13b = Field reversible from F1 to F2 mounting
Note: Please review the AutomationDirect Terms & Conditions for warranty and service on this product. Warranty service can be arranged through numerous Marathon Electric service centers. See list of service centers on our Web site at www.automationdirect.com.

Performance Data (460 Volt) – microMAX (with encoder)

Part Number	hp	NEMA Design	F.L. rpm	Min. rpm	F.L. Amps @460V	N.L. Amps @460V	F.L. Torque (lb·ft)	B.D. Torque (lb·ft)	Max. CHP rpm*	Max. Safe rpm	F.L. Effic.	F.L. Power Factor	Rotor Inertia (lb·ft2)
Y286A	3	B	1755	0	4.1	2.3	9.0	49.3	3510	5400	87.5	78.5	0.42

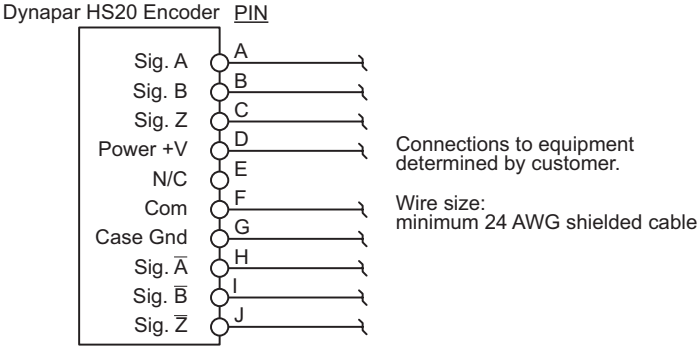
*** Maximum Constant hp rpm is for direct coupled loads.**

microMAX Motors Shaft-Mounted Encoder*

A Dynapar Model HS20 shaft-mounted encoder is supplied with the microMAX motor. The 5/8-in hollow-shaft encoder requires a 5–26 VDC power source, provides a count of 1024 pulses per revolution (PPR), differential line driver output, and includes 10 screw-terminal wiring connections.

** The encoder cable gland accepts cable diameters from 0.187–0.30 in.*
** There is no manufacturer's published tightening torque for the encoder screw terminals.*

Encoder Wiring Connections



Vector Duty Motors



Features

- Class F IRIS® insulation system
- Constant torque operation from 0 to base speed on vector drive
- Constant horsepower operation to twice base rpm
- Continuous duty at 40° C ambient
- Optimized for operation with IGBT inverter (NEMA Design A)
- Class F N/C thermostats (one per phase)
- Utilizes double shielded ball bearings
- Exxon Polyrex® EM bearing grease
- C-Face with rigid base, except C-Face with removable rigid base as noted
- F1 standard conduit box location, field reversible to F2 (except as noted)
- Available with optional encoder installed on opposite drive end
- Electrically reversible
- UL Recognized, CSA Certified, and CE Mark
- Three year warranty

Motor Shipping Schedule *		
Same or one day *	Up to 7 days	Up to 10 days

Color indicates shipping lead time in business days. Check stock status online.

* Certain heavy and oversized items can be shipped only via LTL. Check our website for current shipping method constraints by part number.

Applications

- Designed for inverter or vector applications where up to a 1000:1 constant torque speed range is required.
- Typical uses include: material handling, machine tools, conveyors, crane and hoist, metal processing, test stands, pumps, compressors, textile processing, and other industrial machinery installed in dusty or dirty environments.

230/460V Motor Specifications

Part Number *	Price	hp	Base rpm	Volts	Enclosure	NEMA Frame	Model No.	F.L. Amps	Weight (lb) *	Footnotes	Drawing Links
Y592	$460.00	1/4	1800	230/460	TENV	56C	56H17T2001	1.2 / 0.6	19	T, S, 13	PDF
Y534	$576.00	1/2	1800	230/460	TENV	56C	56H17T5301	1.6 / 0.8	28	T, S, 6, 13	PDF
Y535	$687.00	1	1800	230/460	TENV	56C	56H17T5302	3.0 / 1.5	41	T, S, 6, 13	PDF
Y536	$706.00	1	1800	230/460	TENV	143TC	143THTR5326	3.0 / 1.5	43	T, S, 6, 13	PDF
Y537	$817.00	1	1200	230/460	TENV	145TC	145THTR5376	3.8 / 1.9	49	T, S, 6, 13	PDF
Y538	$857.00	1-1/2	1800	230/460	TENV	145TC	145THTR5326	4.8 / 2.4	50	T, S, 6, 13	PDF
Y551	$1,163.00	2	1800	230/460	TENV	145TC	145THTN6046	6.0 / 3.0	72	T, CI	PDF

* Refer to the Motor Shipping Schedule table for shipping information.

Footnotes:
6 Bolt-on, removable base for footless mounting option
13 F1 Mounting Only, cannot modify to F2
AL Aluminum Frame Construction

Footnotes (continued):
CI Cast-iron Frame Construction
I Intermittent duty from 90-120 Hz operation
S Steel Frame Construction

Footnotes (continued):
T Thermostat overload

Note: Please review the AutomationDirect Terms & Conditions for warranty and service on his product.

Motor Performance Data (460 Volt) *

Part Number	hp	F.L. rpm	F.L. Amps @460V	N.L. Amps @460V	F.L. Torque (lb·ft)	B.D. Torque (lb·ft)	Max. C hp rpm *	Max. Safe rpm	F.L. Effic. (%)	F.L. Power Factor	Rotor Inertia (lb·ft2)	Ohms/Ph - Equiv. Wye Circuit (460 VAC) (at rated operating temp. in 40° C ambient)				
												R1	R2	X1	X2	XM
Y592	1/4	1755	0.6	0.45	0.75	4.5	3540	5400	70.0	58.0	0.045	26.300	23.000	30.240	14.700	572.000
Y534	1/2	1735	0.8	0.52	1.5	5.8	3510	5400	80.0	72.0	0.056	22.307	17.028	24.123	18.163	532.976
Y535	1	1750	1.5	1.0	3.0	15.0	3505	5400	84.0	75.0	0.110	8.378	5.623	10.707	9.912	278.036
Y536	1	1750	1.5	1.0	3.0	15.0	3505	5400	84.0	75.0	0.110	8.378	5.623	10.707	9.912	278.036
Y537	1	1145	1.9	1.3	4.5	16.0	2260	5400	80.0	62.5	0.140	10.302	8.372	13.793	15.325	193.835
Y538	1-1/2	1755	2.4	1.6	4.5	29.0	3518	5400	85.5	69.0	0.140	4.257	3.538	5.998	5.884	161.009
Y551	2	1750	3.0	1.7	6.0	28.5	3525	5400	85.5	78.0	0.130	3.834	2.897	5.950	5.637	154.800

* Maximum Constant hp rpm is for direct coupled loads.

marathon® Motors

Black Max® Vector Duty Motors



Features

- Class F MAX GUARD® insulation system
- Constant torque operation from 0 to base speed on vector drive
- Constant horsepower operation to twice base rpm
- Continuous duty at 40° C ambient
- Optimized for operation with IGBT inverter (NEMA Design A)
- Class F N/C thermostats (one per phase)
- Utilizes double shielded ball bearings
- Exxon Polyrex® EM bearing grease
- C-Face with rigid base, except C-Face with removable rigid base as noted
- F1 standard conduit box location, field reversible to F2 (except as noted)
- Available with optional encoder installed on opposite drive end
- Electrically reversible
- UL Recognized, CSA Certified, and CE Mark
- Three year warranty (through Marathon Electric)

Applications

- Designed for inverter or vector applications where up to a 1000:1 constant torque speed range is required.
- Typical uses include: material handling, machine tools, conveyors, crane and hoist, metal processing, test stands, pumps, compressors, textile processing, and other industrial machinery installed in dusty or dirty environments.

Motor Shipping Schedule *		
*Same or one day **	*Up to 7 days*	*Up to 10 days*

Color indicates shipping lead time in business days. Check stock status online.
*** Certain heavy and oversized items can be shipped only via LTL. Check our website for current shipping method constraints by part number.**

230/460V Motor Specifications

Part Number *	Price	hp	Base rpm	Volts	Enclosure	NEMA Frame	Model No.	F.L. Amps	Weight (lb) *	Footnotes	Drawing Links
Y541A	$1,594.00	3	1800	230/460	TENV	182TC	182THTY7726	8.2 / 4.1	110	T, AL	PDF
Y543A	$1,934.00	5	1800	230/460	TENV	184TC	184THTY7726	13.4 / 6.7	125	T, AL	PDF
Y545	$2,467.00	7-1/2	1800	230/460	TENV	213TC	213THTL7726	21.0 / 10.5	146	T, AL	PDF
Y547	$2,892.00	10	1800	230/460	TENV	215TC	215THTL7726	27.0 / 13.5	159	T, AL	PDF
Y549	$3,405.00	15	1800	230/460	TENV	254TC	254THTL5726	40 / 20	250	T, AL, I	PDF

*** Refer to the Motor Shipping Schedule table for shipping information.**

Footnotes:
6 Bolt-on, removable base for footless mounting option
13 F1 Mounting Only, cannot modify to F2
AL Aluminum Frame Construction

Footnotes (continued):
CI Cast-iron Frame Construction
I Intermittent duty from 90-120 Hz operation
S Steel Frame Construction

Footnotes (continued):
T Thermostat overload

Note: Please review the AutomationDirect Terms & Conditions for warranty and service on his product. Warranty service can be arranged through numerous Marathon Electric service centers. See list of service centers on our Web site at www.AutomationDirect.com.

Motor Performance Data (460 Volt) *

Part Number	hp	F.L. rpm	F.L. Amps @460V	N.L. Amps @460V	F.L. Torque (lb·ft)	B.D. Torque (lb·ft)	Max. C hp rpm *	Max. Safe rpm	F.L. Effic. (%)	F.L. Power Factor	Rotor Inertia (lb·ft2)	Ohms/Ph - Equiv. Wye Circuit (460 VAC) (at rated operating temp. in 40° C ambient)				
												R1	R2	X1	X2	XM
Y541A	3	1755	4.1	2.3	9.0	49.3	3515	5400	87.5	78.5	0.420	1.578	1.802	2.838	2.091	94.13
Y543A	5	1760	6.7	3.2	14.9	61.5	3520	5400	89.5	79	0.520	1.428	1.05	2.09	3.379	63.334
Y545	7-1/2	1765	10.5	5.5	22.3	95.5	3525	4200	90.2	76.0	0.850	0.699	0.567	1.765	2.260	38.178
Y547	10	1774	13.5	7.4	29.5	125.0	3540	4200	90.2	76.0	1.300	0.369	0.334	1.423	2.281	34.932
Y549	15	1765	20	11.0	45.0	170.0	3550	4200	92.4	76.0	1.600	0.134	0.316	1.047	1.569	22.151

*** Maximum Constant hp rpm is for direct coupled loads.**

Black Max® Vector Duty Motors

Motor Shipping Schedule *		
*Same or one day **	*Up to 7 days*	*Up to 10 days*

Color indicates shipping lead time in business days. Check stock status online.
*** Certain heavy and oversized items can be shipped only via LTL. Check our website for current shipping method constraints by part number.**

Motor with Shaft-Mounted Encoder*

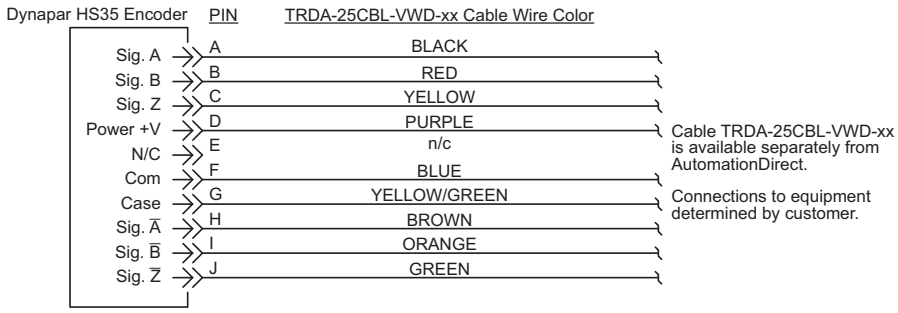
A Dynapar Model HS35 shaft-mounted encoder can be supplied pre-installed on the motors as shown in the price table below. The encoder requires a 5–26 VDC power source, provides a count of 1024 pulses per revolution (PPR) differential line driver output, and includes a 10-pin mating connector.

Motor Accessories		
Part Number	*Price*	*Description **
A772	$1,224.00	Encoder kit, replacement, for Black Max encoder motors. Dynapar HS35 encoder, 5–26 VDC input, Line Driver output, 1024 pulses per revolution, 5/8-in bore.

*** Replacement/spare encoder kit for Black Max Yxxx-A772 motors; can also be field installed on Black Max Yxxx motors without encoders.**

Encoder Connector Pinout

Note: A mating connector is supplied with the encoder. Prewired cables TRDA-25CBL-VWD-xx (10, 20, & 30 ft) and replacement MS connectors TRDA-25CON-VWD are available from AutomationDirect.



Motor with Pre-installed Shaft-Mounted Encoder		
230/460V Motors		
Part Number	*Price*	*hp*
Y541A-A772	$2,972.00	3
Y543A-A772	$3,312.00	5
Y545-A772	$3,820.00	7 1/2
Y547-A772	$4,246.00	10
Y549-A772	$4,758.00	15

Note: Please review the AutomationDirect Terms & Conditions for warranty and service on this product.
Warranty service can be arranged through numerous Marathon Electric service centers.
See list of service centers on our Web site at www.AutomationDirect.com.

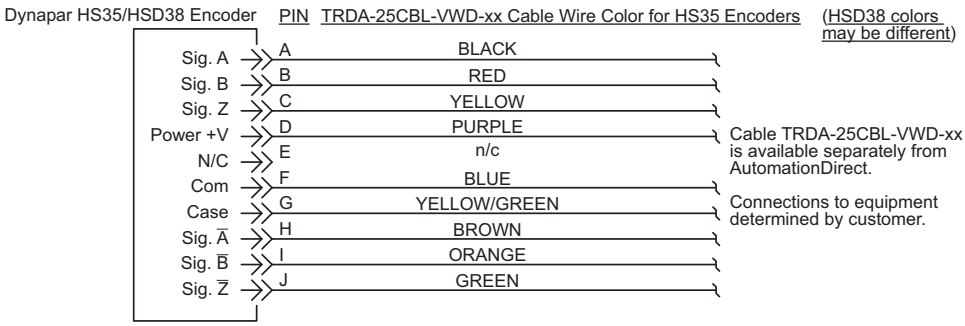
Blue Max® 2000 Vector Duty Motor Accessories

Motor Accessories		
Part Number	**Price**	**Description ***
A775	$849.00	Encoder kit, replacement, for Blue Max TEBC encoder motors. Dynapar HSD38 encoder, 5–26 VDC input, Line Driver output, 1024 pulses per revolution. 1-in bore.

*** Replacement/spare encoder kit for Blue Max encoder motors; can also be field installed on Blue Max Y5xx motors; select appropriate encoder kit per motor fan type (TEFC or TEBC).**

Encoder Connector Pinout

Note: A mating connector is supplied loose for the customer's wiring on encoder equipped TEFC motors and a mating connector pre-wired to a cable and pigtailed in a conduit box on encoder equipped TEBC motors.
Prewired cables TRDA-25CBL-VWD-xx (10, 20, & 30 ft) and replacement MS connectors TRDA-25CON-VWD are available from AutomationDirect.



NEMA Premium® Efficiency Inverter Duty Motors



Features

- Meets or exceeds NEMA Premium efficiencies
- Inverter duty
- Suitable for use with ALS (across-the-line starting) or IGBT (AC drive)
- 10:1 variable torque and constant torque on VFD with 1.0 service factor
- 1.15 service factor on sinewave; 1.0 service factor on IGBT power
- Class F insulation
- Continuous duty at 40° C ambient
- Rolled steel construction with C-face rigid base mounting
- F3 conduit box location
- Utilizes ball bearings
- Electrically reversible
- UL Recognized, CSA Certified, and CE Mark
- Three-year warranty

Applications

- Typical uses include gear reducers, pumps, machine tools, and other direct-coupled equipment installed in damp, dusty, or dirty environments where long life and ultra-high efficiency is desired.

Motor Shipping Schedule *		
*Same or one day **	*Up to 7 days*	*Up to 10 days*

Color indicates shipping lead time in business days. Check stock status online.

*** Certain heavy and oversized items can be shipped only via LTL. Check our website for current shipping method constraints by part number.**

208–230/460V Motor Specifications

*Part Number**	*Price*	*hp*	*Base rpm*	*Volts*	*Enclosure*	*NEMA Frame*	*Model No.*	*F.L. Amps*	*Weight (lb)**	*Drawing Links*
E2001A	$691.00	1	1800	208–230 / 460	TEFC	143TC	143TTFR16053	3.3–3.3 / 1.65	48	PDF
E2002	$762.00		1200			145TC	145TTFR6078	3.8–3.8 / 1.9	42	PDF
E2004A	$727.00	1-1/2	1800			145TC	145TTFR16331	4.7–4.6 / 2.3	50	PDF
E2007A	$821.00	2	1800			145TC	145TTFR16329	6.2–6.0 / 3.0	65	PDF

*** Refer to the Motor Shipping Schedule table for shipping information.**
Certain heavy and oversized items can be shipped only via LTL. Check our web site for current shipping method constraints by part number.

† These specifications are for the Leeson motor currently being sold. Marathon manufactured a previous version of this Part Number (that had a different model #), and that version had some different specifications. For detailed information on the previous motor, please refer to the "Previous Marathon Model Numbers" table on the next page, or click on the previous motor's specification at www.AutomationDirect.com/Retired-Products.

Notes: Please review the AutomationDirect Terms & Conditions for warranty and service on this product.

NEMA Premium® Efficiency Inverter Duty Motors

Performance Data

Performance Data (460 Volt)															
Part Number	hp	NEMA Design	F.L. rpm	Min rpm	Current (Amps)			Torque (lb·ft)			Max CHP rpm*	Max Safe rpm	F.L. Effic. (%)	F.L. Power Factor	Rotor Inertia ($lb·ft^2$)
					No Load	Full Load	Locked Rotor	Full Load	Locked Rotor	Break -down					
E2001A	1	B	1765	177	1.2	1.7	17	3.0	13.7	16.8	1765	4000	85.5	68	0.12
E2002			1170	117	1.3	1.9	10	4.5	13.5	15.8	1755	5400	82.5	60	0.14
E2004A	1-1/2	B	1755	176	1.5	2.3	24	4.5	21.2	26	1755	4000	86.5	71	0.14
E2007A	2		1760	176	1.9	3.0	30.5	6.0	24.5	33.2	1760	4000	86.5	71	0.14

*** Maximum Constant hp rpm is for direct coupled loads.**

† These specifications are for the Leeson motor currently being sold. Marathon manufactured a previous version of this Part Number (that had a different model #), and that version had some different specifications. For detailed information on the previous motor, please refer to the previous motor's specification at www.AutomationDirect.com/Retired-Products.

ACCU-Torq® Vector Duty 3-Phase AC Motors

56C – 256TC Frame – 1/4hp to 20hp

Available with or without encoder installed

U.S. MOTORS® ACCU-Torq® series AC motors offer a solution to applications requiring accurate positioning or precise speed control without the rapid acceleration dynamics of a servomotor. ACCU-Torq motors are designed to be used with AC drives, including full closed-loop vector drives, in applications requiring up to a 5000:1 constant torque speed range.

Standard Features

- 230/460 VAC
- Rated output: 1/4 - 20hp
- 1800 rpm, with or without encoder
- 1200 rpm up to 10hp
- Encoder Motors are pre-built with Avtron HS35A encoders. Complete encoder kit is also available for separate purchase.
- Standard motors have dual shaft for encoder mounting.
- Class F insulation (155° C), inverter duty NEMA MG1 Part 31
- Constant torque operation; zero to base speed on vector drives
- Constant horsepower operation to twice base speed
- Optimized for operation with IGBT and intelligent power module drives (NEMA®† Design A)
- F-1 Standard, field convertible to F-2 for 180 frame and above
- Normally closed thermostats standard
- Horizontal or Vertical mounting
- Continuous duty at 40°C ambient

Applications

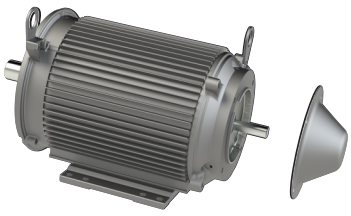
- Packaging machinery
- Extruders
- Material handling
- Indexing and positioning
- Positive displacement pumps
- DC Motor Replacements



UN5T2BC



UN5T2BC-HS35A



Cover can be removed to reveal second shaft



HS35AY1CDU1EA000

ACCU-Torq® Vector Duty 3-Phase AC Motors

Motor Specifications – 3-phase												
Part Number	Price	hp*	Base rpm	Volts	Enclosure	Encoder Included	NEMA Frame	Service Factor	NEMA Design	Weight (lb)	Data Pack Links*	Drawing Links
Rigid Base With C-face - 1800 rpm												
UN14T2BC	$425.00	1/4	1800	230/460 VAC	TENV	No	56C	1.0	A	35	PDF	PDF
UN14T2BC-HS35A	$1,409.00					Yes				30	PDF	PDF
UN12T2BC	$515.00	1/2				No				42	PDF	PDF
UN12T2BC-HS35A	$1,499.00					Yes				30	PDF	PDF
UN1T2BFC	$609.00	1				No	56C			43	PDF	PDF
UN1T2BFC-HS35A	$1,589.00					Yes				30	PDF	PDF
UN1T2BC	$609.00					No	143TC			43	PDF	PDF
UN1T2BC-HS35A	$1,589.00					Yes				30	PDF	PDF
UN32T2BC	$749.00	1 1/2				No	145TC			50	PDF	PDF
UN32T2BC-HS35A	$1,724.00					Yes				35	PDF	PDF
UN2T2BC	$802.00	2				No				57	PDF	PDF
UN2T2BC-HS35A	$1,775.00					Yes				60	PDF	PDF
UN3T2BC	$899.00	3				No	182TC			65	PDF	PDF
UN3T2BC-HS35A	$1,869.00					Yes				60	PDF	PDF
UN5T2BC	$1,045.00	5				No	184TC			85	PDF	PDF
UN5T2BC-HS35A	$2,011.00					Yes				60	PDF	PDF
UN7T2BC	$1,429.00	7 1/2				No	213TC			135	PDF	PDF
UN7T2BC-HS35A	$2,384.00					Yes				105	PDF	PDF
UN10T2BC	$1,727.00	10				No	215TC			178	PDF	PDF
UN10T2BC-HS35A	$2,672.00					Yes				120	PDF	PDF
UN15T2BC	$2,385.00	15				No	254TC			255	PDF	PDF
UN15T2BC-HS35A	$3,309.00					Yes				120	PDF	PDF
UN20T2BC	$2,939.00	20				No	256TC			266	PDF	PDF
UN20T2BC-HS35A	$3,846.00					Yes				230	PDF	PDF
Rigid Base With C-face - 1200 rpm												
UN1T3BC	$665.00	1	1200	230/460 VAC	TENV	No	145TC	1.0	A	35	PDF	PDF
UN2T3BC	$1,109.00	2					184TC			75	PDF	PDF
UN5T3BC	$1,967.00	5					215TC			60	PDF	PDF
UN7T3BC	$2,625.00	7 1/2					254TC			211	PDF	PDF
UN10T3BC	$3,169.00	10					256TC			266	PDF	PDF

*See Motor Data Pack for additional specifications

ACCU-Torq® Vector Duty 3-Phase AC Motors

Performance Data – 3-phase

Part Number	hp*	Full Load rpm*	Volts*	Current (230V/460V)			Torque			Resistance Main		Torque Speed Rating		Full Load Effic. %	Full Load Power Factor	Moment of Inertia (lb·ft2)
				No Load Current	Full Load Amps	Locked Rotor Amps	Full Load (lb·ft)	Locked Rotor % of Full Load Torque	Break-down % of Full Load Torque	230V	460V	Constant	Variable			
Rigid Base With C-face - 1800 rpm																
UN14T2BC	1/4	1765	230/460 VAC	0.8 / 0.4	1 / 0.5	8.2 / 4.1	0.70	419	586	12.42	49.69	5000:1	5000:1	77.0	61.1	0.070
UN14T2BC-HS35A					1 / 0.5						49.69					
UN12T2BC	1/2	1750		1 / 0.5	1.5 / 0.8	12.1 / 6	1.50	335	457	6.47	25.87			84.0	74.2	0.105
UN12T2BC-HS35A					1.5 / 0.8						25.87					
UN1T2BC	1	1755		2.2 / 1.1	3.2 / 1.6	32 / 15.8	3.00	480	606	2.72	10.88				69.5	0.107
UN1T2BC-HS35A					3.2 / 1.6						10.88					
UN1T2BFC					3.2 / 1.6	31 / 15.6		476	600	2.66	10.64				69.3	
UN1T2BFC-HS35A					3.2 / 1.6						10.64					
UN32T2BC	1 1/2	1760		3.2 / 1.6	4.6 / 2.3	52 / 25.9	4.50	518	665	1.55	6.18			86.5	69.7	0.14
UN32T2BC-HS35A					4.6 / 2.3						6.18					
UN2T2BC	2	1750		3.3 / 1.7	5.6 / 2.8	56 / 28	6.00	425	543	1.37	5.46				76.8	0.174
UN2T2BC-HS35A					5.6 / 2.8						5.46					
UN3T2BC	3	1770		7.9 / 4	10.1 / 5	92 / 46	8.90	400	573	0.77	3.08			87.5	63.6	0.314
UN3T2BC-HS35A					10.1 / 5						3.08					
UN5T2BC	5			8 / 4	14.2 / 7.1	139 / 70	14.80	363	522	0.46	1.84			90.2	74.5	0.472
UN5T2BC-HS35A					14.2 / 7.1						1.84					
UN7T2BC	7 1/2	1775		9 / 4.5	18.8 / 9.4	178 / 89	22.20	349	445	0.21	0.84			92.4	80.7	0.964
UN7T2BC-HS35A					18.8 / 9.4						0.84					
UN10T2BC	10			12.9 / 6.4	25.3 / 12.7	275 / 138	29.60	416	519	0.13	0.53			93.0	79.6	1.33
UN10T2BC-HS35A					25 / 12.7						0.53					
UN15T2BC	15	1785		14.3 / 7.2	36 / 17.8	345 / 172	44.20	394	381	0.08	0.33			94.5	83.4	3.43
UN15T2BC-HS35A					36 / 17.8						0.33					
UN20T2BC	20	1780		22.9 / 11.5	50 / 24.8	486 / 243	58.90	419	403	0.06	0.24			94.1	80.3	3.56
UN20T2BC-HS35A					50 / 24.8						0.24					
Rigid Base With C-face - 1200 rpm																
UN1T3BC	1	1150	230/460 VAC	7.1	3.7 / 1.8	21.1 / 10.5	4.60	298	390	3.59	14.35	5000:1	5000:1	80.0	63.8	0.122
UN2T3BC	2	1170		2.1 / 4.3	6.2 / 3.1	47.3 / 23.5	9.00	228	386	1.79	7.17			86.5	69.4	0.361
UN5T3BC	5	1175		10.9 / 5.5	15.9 / 7.9	127.7 / 63.9	22.30	383	445	0.35	1.42			89.5	65.9	0.928
UN7T3BC	7 1/2	1185		10.5 / 5.3	19.8 / 9.9	162.7 / 81.4	33.20	285	393	0.27	1.08			91.7	77.4	3.21
UN10T3BC	10			11.9 / 6	25 / 12.7	199.8 / 99.9	45.00	269	366	0.20	0.79			92.4	80.1	4.05

*See Motor Data Pack for additional specifications linked in specification table above

Encoder Kit

HS35A Encoder Kit Overview

Avtron™ HS35A Encoder kits come standard on US MOTORS ACCU-Torq® series encoder motors or can be purchased separately for installation on existing dual shaft motors such as Marathon Black Max. The HS35A encoders fit shafts from 1/2" to 1" easily, using durable shaft inserts. The encoders can be adapted to different shaft sizes by replacing or removing the included inserts, enabling customer stockrooms to swiftly meet any need. The shaft inserts and insulated bearings also provide isolation from motor shaft currents, while permitting case grounding to meet NEC requirements. Avtron encoders have superior shaft seals and bearings that stay sealed to keep out contamination caused by temperature cycling and liquid sprays. Encoder seals are protected by mechanical barriers to prevent flexing or failure, and Avtron's rugged bearings feature synthetic lubricants for even longer life. Avtron uses only unbreakable disks and a sensor-to-disk gap over eight times larger than the competition. The optical HS35A encoders use superior sensor, disk, bearing, and seal technology to give top performance in industrial conditions.



HS35AY1CDU1EA000

HS35A Features

- All digital, fully integrated design
- Easily mountable on US MOTORS ACCU-Torq series or Marathon Black Max Series vector duty motors
- No mechanical adjustments or trim potentiometers
- Innovative shaft ring retains collar during installation
- Advanced sensor technology
- Superior bearings with synthetic lubricant for longer life
- Encoder provides signal complements and marker pulse (A,A-, B,B-, Z,Z-)
- Insulated from motor shaft currents
- Models can be resized by interchanging inserts
- Included basket guard adds even more protection

HS35A Encoder Specifications	
Part Number	HS35AY1CDU1EA000
Price	$922.00
Operating Power	Volts: 5–28 VDC Current: 50 mA, no load
Output Format	A Quad B with marker (A,/A, B,/B, Z,/Z)
Frequency Range	0 to 125 kHz
PPR	1024
Max Speed	6000 rpm
Temperature	-20° to 100°C*
Environmental	IP65
Vibration	5-2000 Hz
Shock	50G, 11ms duration
Weight	1.6 lbs [730g]
Drawing Link	PDF

***Consult Avtron for temperature/speed derating:**
https://www.nidec-avtronencoders.com/contact



Click image above for Encoder Installation:
https://www.youtube.com/watch?v=ZhX63xp7kOw