Ducommun LaBarge Technologies, Inc.
For more information, contact **our sales team** at
310.513.7200 or **MCDSales@ducommun.com**
www.ducommun.com

HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR FOR OIL AND GAS EXPLORATION

AC INDUCTION MOTORS

Ducommun's AC Induction Motors for downhole oil and gas exploration tools are used worldwide by most prime oil service companies. The performance of our highly reliable motors has been continuously improved over the last 20 years to provide unsurpassed lifetimes in extremely harsh operating environments at high temperatures-high pressures (HTHP) up to 232°C (450°F) and 2068 bar (30,000 psi).

The motors are available from size 15 (OD 1.5") to size 38 (OD 3.8").

Our latest developments of high efficiency motors provide additional reliability for the increasingly demanding downhole drilling environment.

The success of high temperature/pressure motors frequently requires units with exceptionally long and thin motor designs from 1.5" Dia x 9" long to 3.7" Dia x 14" long without gear heads. Ducommun has invested to acquire the required tooling and expertise to routinely meet these requirements.

FEATURES & BENEFITS

- High Temperatures-High Pressures (HTHP) up to 232°C (450°F) and 2068 Bar (30,000 psi) ambient temperature.
- High Efficiency design to support lowest temperature rise at downhole operation.
- Single Phase AC Motor
- High Starting Torque
- 115 To 600 Volts, 60-400 Hz
- Qualified While Immersed In Hydraulic Oil Per MIL-H-83282C

APPLICATIONS

- Oil & Gas Exploration Tools
- Rotary Steering Systems (RSS)
- Measurement While Drilling (MWD)
- Logging While Drilling (LWD
- Tractor Tools
- Completion Tools
- Formation Testing Tools
- Hydraulic Pumps
- Actuators

OPTIONS

- Designed With Gear Head
- Designs With Feedback Devices
- 3 Phase Designs
- Custom Designs

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SPECIFICATIONS

MODEL	RATED POWER (hp)	RATED SPEED (rpm)	RATED TORQUE (oz-in)	VOLTAGE (V)	FREQUENCY (Hz)	RATED CURRENT (A)	HOUSING OD (inch)	HOUSING LENGTH (inch)	GEAR RATIO
15HA5	1/35	3100	7	160	60	0.9	1.5	7.5	
15HA6	1/16	6336	9.5	250	120	0.5	1.5	9.4	
15HG3	1/16	3520	17.5	140	120	0.75	1.5	13	1.84 to 1
15HG4	1/16	3520	17.5	250	120	0.5	1.5	14	1.84 to 1
18HA6	1/25	2800	16	115-150	60	0.8	1.8	4.7	
18HA7	1/25	2800	16	220-260	60	0.4	1.8	4.7	
18HA8	1/25	2800	16	400	60	0.3	1.8	4.7	
18HA9	1/7	2800	54	400	60	1	1.8	15.7	
18HA10	1/6	2800	60	240-400	60	1.7	1.8	10.7	
18HA11	1/25	2800	16	115-150	60	0.8	1.8	4.7	
20HG1	1/35	360	80	150	60	0.6	2	4.8	7.2 to 1
20HG2	1/35	600	48	150	60	0.5	2	4.8	4.32 to 1
20HG3	1/20	1200	48	150	60	0.5	2	4.8	2.16 to 1
20HG5	1/35	12	2400	115	60	0.75	2	8.2	216 to 1
25HA2	1/25	1400	28	115	60	0.8	2.5	4.3	
25HA5	1/8	3150	38	200	60	0.75	2.5	4.3	
25HA6	1/8	3150	38	200	60	0.75	2.5	9.5	
25HA7	1/25	1400	28	115	60	0.65	2.5	4.3	
25HA8	1/25	1400	28	250	60	0.35	2.5	4.3	
25HA10	1/4	3000	85	400	60	1.5	2.5	10	
33HA4	1/3	2840	116	400	60	1.1	3.3	8.4	
33HA5	1/4	3150	80	400	60	1	3.3	8.4	
33HA6	1/6	3000	54	600	60	0.4	3.3	6.5	
33HA7	1/3	3150	125	400	60	1.1	3.3	9.8	
33HA8	1/4	3150	80	400	60	1	3.3	8.5	
33HA9	1/16	3400	21	115	60	1.5	3.3	8.4	
33HA10	1/3	2840	116	400	60	1.1	3.3	8.4	
33HA11	1/4	3150	80	400	60	1	3.3	8.4	
33HA12	1/8	3000	40	400	60	0.5	3.3	7	
33HA13	1/4	3150	80	400	60	1	3.3	8.4	
33HA14	1	3000	340	400	60	3	3.3	10.4	
33HA15	1/3	3000	120	400	60	1.7	3.3	8.4	
35HAx	1	3000	320	600	60	2	3.5	10.4	
37HAx	1.5	3300	480	600	60	3	3.7	13.8	
38HA2	1/3	3150	135	400	60	1.1	3.8	9.5	

* Single phase, running capacitor required

PART NUMBER CONFIGURATION

The following part number configurations are based on current configurations. For custom design solutions, please contact Ducommun at 310.513.7200 or mcdsales@ducommun.

15	HA	5
Motor size 15: OD 1.5 inches	Motor Type HA: Motor only or HG: Motor with gear head	Ducommun Design Number 5: Design number

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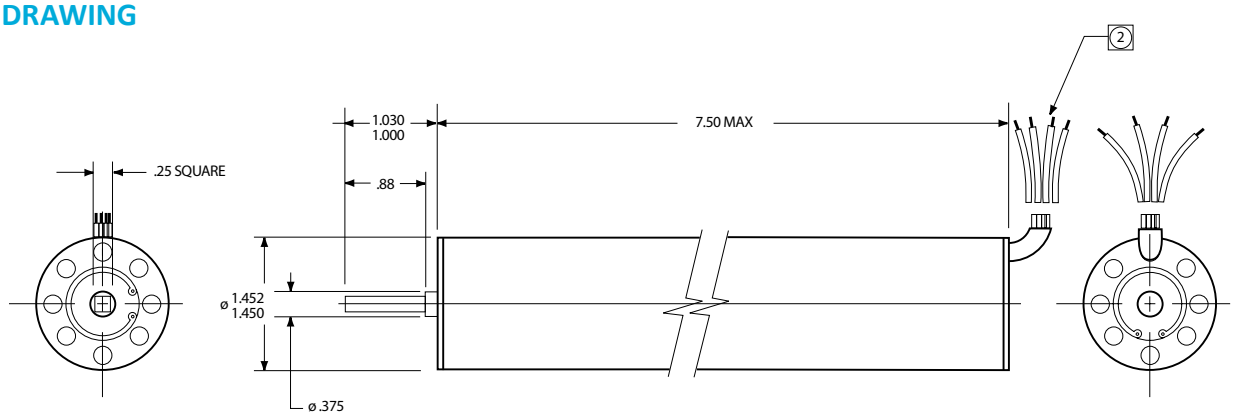
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 15HA5 SERIES

OUTLINE DRAWING



2 LEADWIRES: 20 AWG TEFLON INSULATED PER MIL-W-16878/5 18 INCHES LONG, MIN FROM EDGE OF ENDBELL.

1. ORIENTATION OF HOLES IN ENDBELLS, FRONT TO BACK ARE AT RANDOM

SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
NUMBER OF PHASES	1
LINE VOLTAGE(Vrms ± 2 Vrms)	160
FREQUENCY (Hz ± 1 Hz)	60
VOLTAGE WAVE SHAPE	SINUSOIDAL
VOLTAGE TOTAL HARMONICS DISTORTION (Max)	8

SHAFT END PALY UNDER 3 lbs REVERSING GAUGE LOAD:

0.002/0.005

HEATSINK (PROVIDED BY THE USER):

THE MOTOR SHALL BE INSTALLED INSIDE A STEEL TUBE IN INTIMATE CONTACT WITH THE MOTOR OUTSIDE PERIPHERY (O.D.) OVER THE ENTIRE LENGTH OF THE MOTOR BODY. THE TUBE TEMPERATURE SHALL NOT EXCEED 200˚C.

OPERATING ATTITUDE OF THE MOTOR LONGITUDINAL AXIS:

VERTICAL TO 60˚ Max FROM THE VERTICAL POSITION (30˚ FROM HORIZONTAL) - SHAFT DOWN.

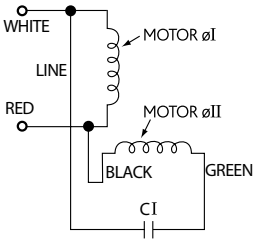
LIFE EXPECTANCY AT DOWNHOLE CONDITIONS:

250 HOURS Min INCLUDING “OFF”TIME

OPERATION AT ROOM AMBIENT IN AIR W/O HEATSINK (ACCEPTANCE TEST)	
FULL LOAD TORQUE STEADY STATE (oz-in, Min)	7.0
SPEED AT FULL LOAD TORQUE, STEADY STATE (rpm, Min)	3,100
CURRENT AT FULL LOAD TORQUE, STEADY STATE (Arms, Min)	0.9
DUTY CYCLE AT FULL LOAD TORQUE, STEADY STATE	5 MINUTES Max ON 10 MINUTES Min OFF STALLED (STARTING)
TORQUE (oz-in, Min)	5.0
STALLED CURRENT (Arms, Max)	1.2
DUTY CYCLE AT STALL:	2 MINUTES Max ON 15 MINUTES OFF

CIRCUIT DIAGRAM

ROTATION SHALL BE CCW AS VIEWED FROM SHAFT END. FOR CW ROTATION INTERCHANGE WHITE AND RED LEADS CAPACITOR NOT SUPPLIED WITH UNIT



2.5 mF±5%, 450 Vrms, 60 Hz, 200˚C

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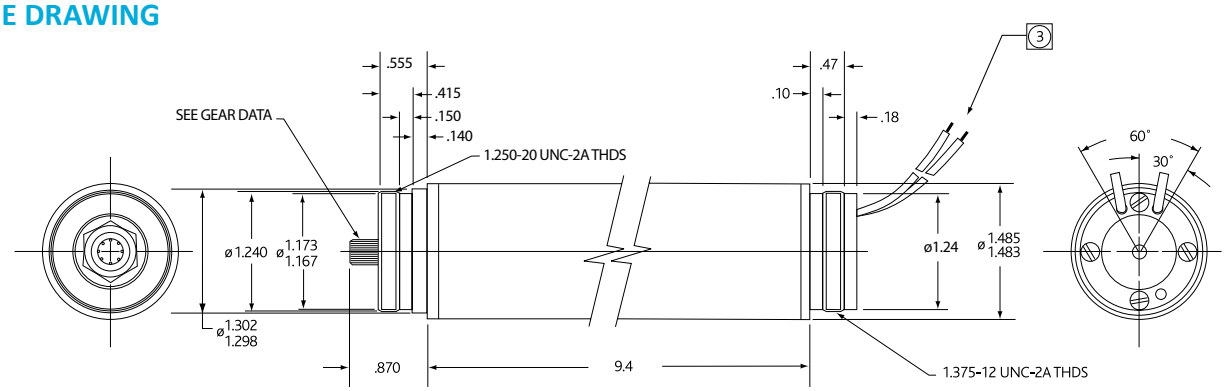
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 15HA6 SERIES

OUTLINE DRAWING



3 LEADWIRES: 24 AWG PER MIL-W-16878/4 COLORS AS SHOWN.
LEADWIRES TO BE 15.0" MIN LENGTH FROM REAR OF MOTOR.

SPECIFICATIONS

GEAR DATA	
AGMA (390.03) CLASS	Q9
COMP TOOTH ERROR (Max)	0.0007
TOTAL COMP ERROR	0.0010
NUMBER OF TEETH	18
DIAMETER PITCH	80
PRESSURE ANGLE	20˚
PITCH DIAMETER	(0.225)

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
NUMBER OF PHASES	1
LINE VOLTAGE (Vrms ± 5)	250
LINE FREQUENCY (Hz ± 1Hz)	120
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)	8
RUNNING TORQUE LOAD(oz-in, Min)	9.5
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)	6336
LINE CURRENT AT RUNNING TORQUE (A)	0.5 (Max)
LINE INPUT POWER AT RUNNING TORQUE (W, Max)	130
STARTING TORQUE (oz-in, Min)	4.4
LINE CURRENT AT START (A, Max)	1.0
LINE INPUT POWER AT START (W, Max)	250

GENERAL DATA	
UNIT IS DESIGNED TO OPERATE WHILE IMMERSED IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI WITH MAX OIL TEMPERATURE OF 200˚C.	
SHAFT END PLAY CHECKED WITH AN 8 lbs REVERSING	
AXIAL LOAD	0.005/0.008

LIFE EXPECTANCY

100 HOURS Min OF TOTAL OPERATING TIME AT THE ABOVE CONDITIONS.

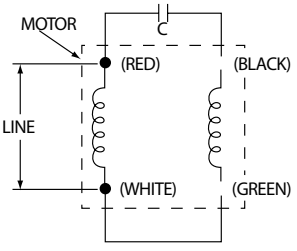
DUTY CYCLE:

CONTINUOUS OPERATION, 10 MINUTES Max “ON”

FOLLOWED BY 15 MINUTES Min “OFF” INTERVALS

CIRCUIT DIAGRAM

MOTOR ROTATION: CONNECTIONS ARE FOR CW ROTATION AS VIEWED FROM SHAFT END. FOR CCW ROTATION INTERCHANGE BLACK AND GREEN LEADWIRES



C: CAPACITOR (NOT SUPPLIED WITH UNIT)
1.2mF ± 5%, 600 VAC, 120 Hz

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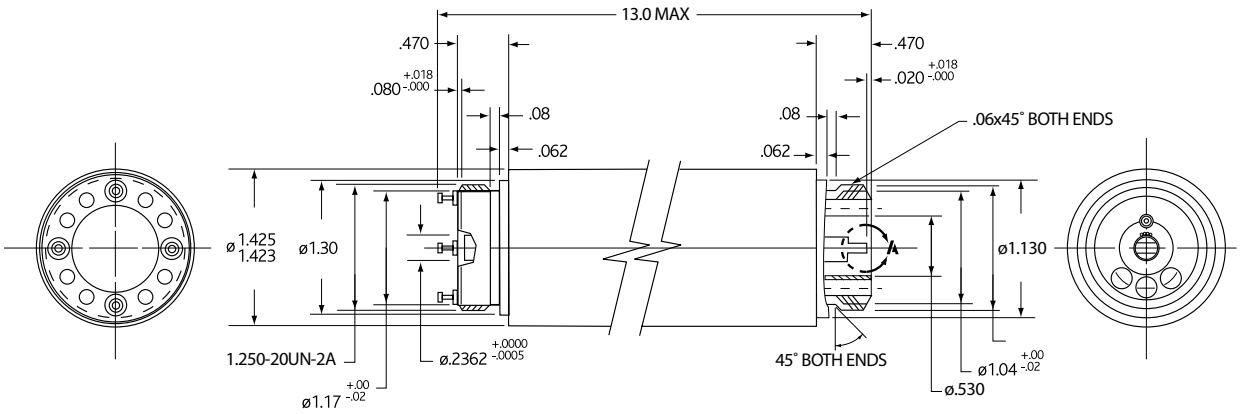
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 15HG3 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
NUMBER OF PHASES	1
LINE VOLTAGE(Vrms ± 4 Vrms)	140
LINE FREQUENCY (Hz ± 1Hz)	120
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)	8
RUNNING TORQUE (oz-in, Min)	17.5
SPEED AT RUNNING TORQUE (rpm, Min)	3520
LINE CURRENT AT RUNNING TORQUE (A, Max)	0.75
LINE INPUT POWER AT RUNNING TORQUE (W, Max)	90
STARTING TORQUE (oz-in, Min)	8
LINE CURRENT AT START (A, Max)	1.85
LINE INPUT POWER AT START (W, Max)	230
DUTY CYCLE:	RUNNING CONTINUOUS

STALL:

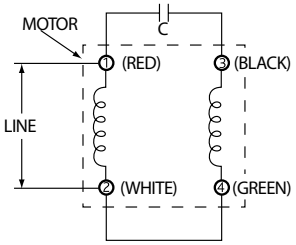
5 (S) Max "ON" FOLLOWED BY 5 MINUTES Min "OFF" PERIOD BETWEEN CONSECUTIVE STALLS.

GENERAL DATA

UNIT IS DESIGNED TO OPERATE WHILE IMMERSED IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI WITH Max OIL TEMPERATURE OF 200˚C.

CIRCUIT DIAGRAM

NOTE: ①②③④ DENOTE TERMINAL NUMBERING. C: CAPACITOR (NOT SUPPLIED WITH UNIT) 4MFD ± 2% 400 VAC, 120 Hz, 400˚F



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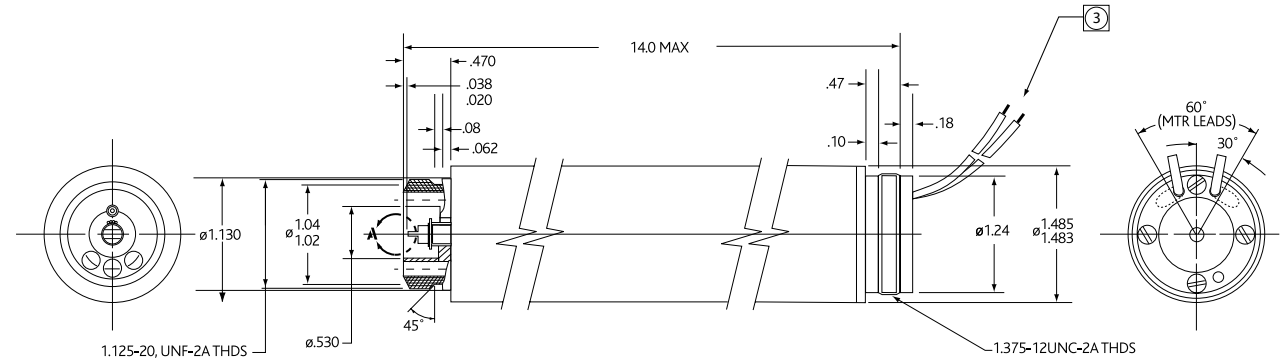
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 15HG4 SERIES

OUTLINE DRAWING



3 LEADWIRES: 24 AWG PER MIL-W-16878/4, COLORS AS SHOWN
LEADWIRES TO BE 15.0" MIN LENGTH FROM REAR OF MOTOR.

2. GEAR RATIO DRIVE MOTOR GEAR HEAD 1.8429 TO 1.

1 THESE VALUES MEASURED AT OUTPUT SHAFT OF GEAR HEAD.

SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
NUMBER OF PHASES	1
LINE VOLTAGE (Vrms±5 Vrms)	250
LINE FREQUENCY (Hz±1)	120
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)	8
RUNNING TORQUE LOAD(oz-in) ①	17.5
SHAFT SPEED AT RUNNING TORQUE (rpm, Min) ①	3520
LINE CURRENT AT RUNNING TORQUE (A, Max)	0.5
LINE INPUT POWER AT RUNNING TORQUE (W, Max)	130
STARTING TORQUE (oz-in, Min)①	8
LINE CURRENT AT START (A, Max)	1.0
LINE INPUT POWER AT START (W, Max)	250

LIFE EXPECTANCY:

100 HOURS Min OF TOTAL OPERATING TIME AT THE ABOVE CONDITIONS.

DUTY CYCLE:

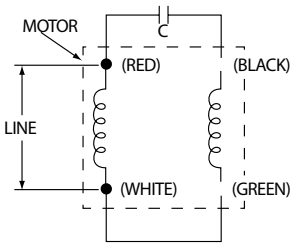
CONTINUOUS OPERATION, 10 MINUTES Max "ON" FOLLOWED BY 15 MINUTES Min "OFF" INTERVALS

GENERAL DATA

UNIT IS DESIGNED TO OPERATE WHILE IMMERSED IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI WITH Max OIL TEMPERATURE OF 200˚C.

CIRCUIT DIAGRAM

MOTOR ROTATION: CONNECTIONS ARE FOR CW ROTATION AS VIEWED FROM SHAFT END. FOR CCW ROTATION INTERCHANGE BLACK AND GREEN LEADWIRES



C: CAPACITOR (NOT SUPPLIED WITH UNIT)
1.2MFD ±5%, 600 VAC, 120 Hz

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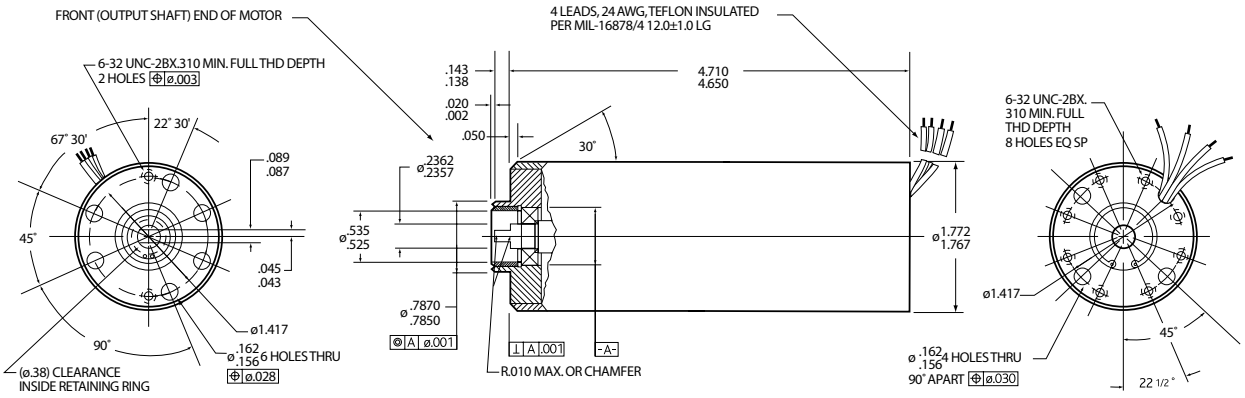
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 18HA6 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
MOTOR TYPE: SINGLE PHASE, PERMANENT SPLIT CAPACITOR (NOT SUPPLIED) REVERSIBLE, FOUR LEADS.	
NO LOAD OPERATION AT	115 V ± 1V

INPUT:	
LINE VOLTAGE (Vrms)	115 TO 150
LINE FREQUENCY (Hz)	60
WAVE SHAPE (8% Max TOTAL HARMONICS DISTORTION)	SINUSOIDAL

CONTINUOUS RUNNING:	
LINE CURRENT (A Max)	0.57
SHAFT SPEED (rpm)	3450 ± 150

OPERATION UNDER LOAD:	
TORQUE LOAD (±0.1 oz-in)	16
LINE VOLTAGE AND CURRENT:	
CURRENT (± .05 A)	0.8 A
VOLTAGE ADJUSTED AS REQUIRED FOR LOAD AND CURRENT	
POWER INPUT (LINE)(Max)	115
SHAFT SPEED (rpm, Min)	2,800

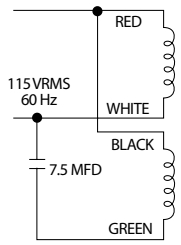
GENERAL DATA	
SHAFT END PLAY UNDER 3 lbs REVERSING GAGE LOAD	0.003 Min
DC RESISTANCE WITH UNIT AT 25˚±5˚C	
RED-WHITE	36 Ω ± 10%
BLACK-GREEN	36 Ω ± 10%

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

ROTATION SHALL BE CLOCKWISE AS VIEWED FROM THE OUTPUT SHAFT END. TO REVERSE ROTATION INTERCHANGE RED AND WHITE LEADS. CAPACITOR NOT SUPPLIED.



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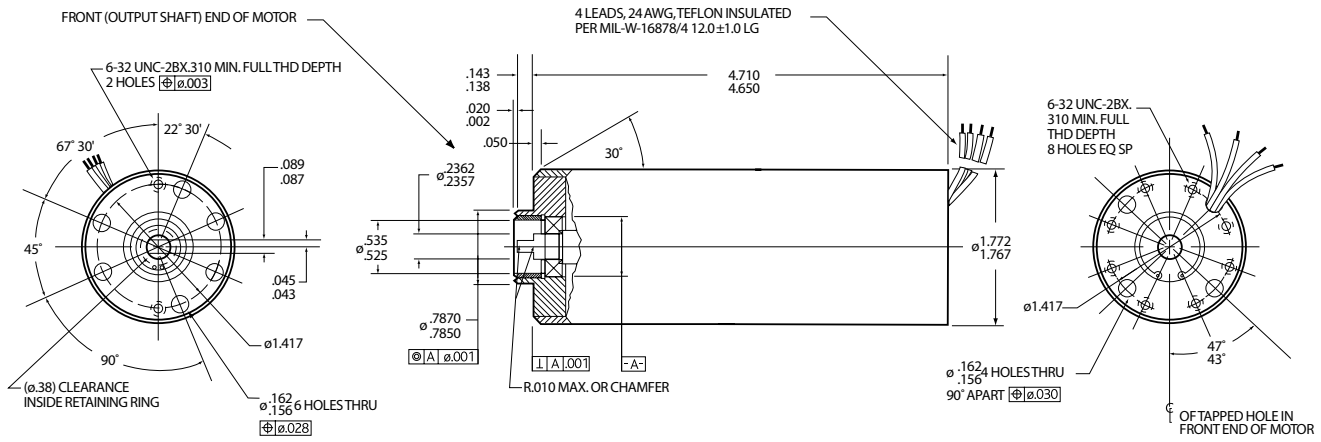
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 18HA7 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
MOTOR TYPE: SINGLE PHASE, PERMANENT SPLIT CAPACITOR (NOT SUPPLIED) REVERSIBLE, FOUR LEADS.	
NO LOAD OPERATION AT	220 V ± 1V

INPUT:	
LINE VOLTAGE (Vrms)	220 TO 260
LINE FREQUENCY (Hz)	60
WAVE SHAPE (8% Max TOTAL HARMONICS DISTORTION)	SINUSOIDAL

CONTINUOUS RUNNING:	
LINE CURRENT (A, Max)	0.30
SHAFT SPEED (rpm)	3450±150

OPERATION UNDER LOAD:	
TORQUE LOAD (±0.1 oz-in)	16
LINE VOLTAGE AND CURRENT:	
CURRENT (±.05 A)	0.42 A
VOLTAGE ADJUSTED AS REQUIRED FOR LOAD AND CURRENT	
POWER INPUT (LINE)(W, Max)	115
SHAFT SPEED (rpm, Min)	2,800

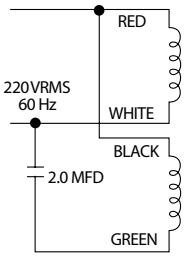
GENERAL DATA	
SHAFT END PLAY UNDER 3 lbs REVERSING GAGE LOAD	0.003 Min
DC RESISTANCE WITH UNIT AT 25˚±5˚C	
RED-WHITE	140 Ω ± 15%
BLACK-GREEN	140 Ω ± 15%

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

ROTATION SHALL BE CLOCKWISE AS VIEWED FROM THE OUTPUT SHAFT END. TO REVERSE ROTATION INTERCHANGE RED AND WHITE LEADS. CAPACITOR NOT SUPPLIED.



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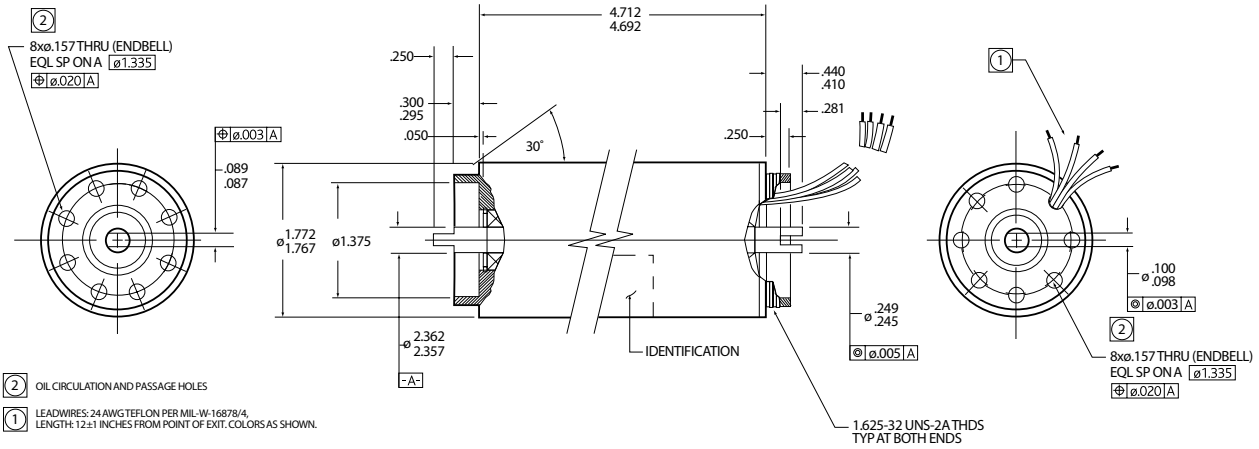
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 18HA8 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
MOTOR TYPE: SINGLE PHASE, PERMANENT SPLIT CAPACITOR (NOT SUPPLIED) REVERSIBLE, FOUR LEADS.	
NO LOAD OPERATION AT	400 V ± 1V

INPUT:	
LINE VOLTAGE (Vrms)	400
LINE FREQUENCY (Hz)	60
WAVE SHAPE (8% Max TOTAL HARMONICS DISTORTION)	SINUSOIDAL

CONTINUOUS RUNNING:	
LINE CURRENT (A, Max)	0.65
SHAFT SPEED (rpm)	3450 ± 150

OPERATION UNDER LOAD:	
TORQUE LOAD (±0.1 oz-in)	16
CURRENT (±.05 A)	0.300
VOLTAGE ADJUSTED AS REQUIRED FOR LOAD AND CURRENT	
POWER INPUT (LINE)(W, Max)	110
SHAFT SPEED (rpm, Min)	2,800

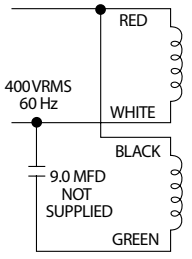
GENERAL DATA	
SHAFT END PLAY UNDER 3 lbs REVERSING GAGE LOAD	0.003 Min
DC RESISTANCE WITH UNIT AT 25˚±5˚C	
RED-WHITE	390 Ω ± 10%
BLACK-GREEN	390 Ω ± 10%

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

ROTATION SHALL BE CW AS VIEWED FROM SHAFT END. FOR CCW ROTATION INTERCHANGE WHITE AND RED LEADS.



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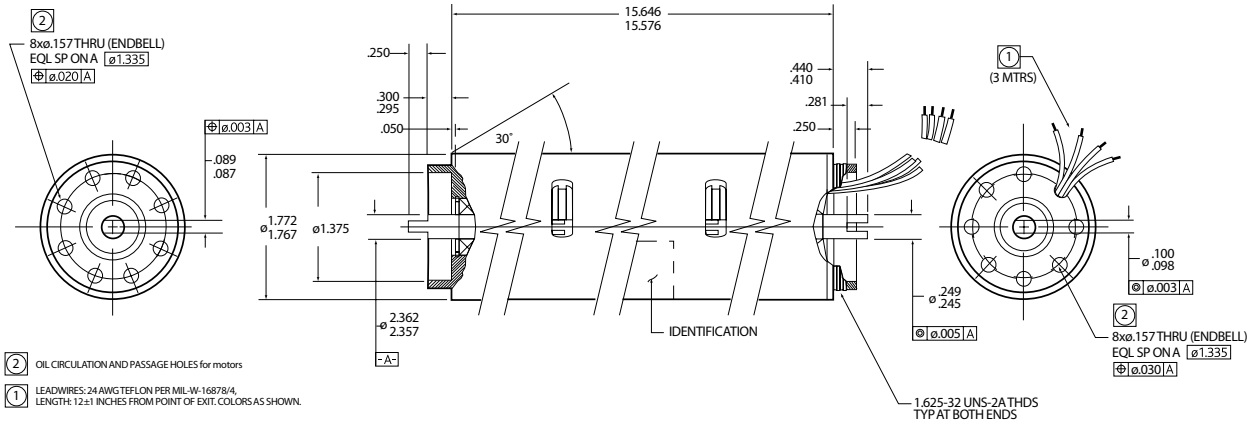
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 18HA9 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
MOTOR TYPE: SINGLE PHASE, PERMANENT SPLIT CAPACITOR (NOT SUPPLIED) REVERSIBLE, FOUR LEADS.	
NO LOAD OPERATION AT	400 V ± 1V

INPUT:	
LINE VOLTAGE (Vrms)	400
LINE FREQUENCY (Hz)	60
WAVE SHAPE (8% Max TOTAL HARMONICS DISTORTION)	SINUSOIDAL

CONTINUOUS RUNNING:	
LINE CURRENT (A, Max)	0.825
SHAFT SPEED (rpm)	3450 ± 150

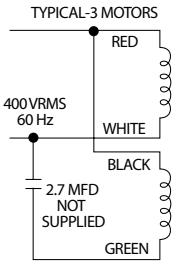
OPERATION UNDER LOAD:	
TORQUE LOAD (±0.1 oz-in)	54
CURRENT (±.05 A)	1.00
VOLTAGE ADJUSTED AS REQUIRED FOR LOAD AND CURRENT	
POWER INPUT (LINE)(W, Max)	300
SHAFT SPEED (rpm, Min)	2,800

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

MOTOR ROTATION: CONNECTIONS ARE FOR CW ROTATION AS VIEWED FROM SHAFT END. FOR CCW ROTATION INTERCHANGE RED AND WHITE LEADWIRES.



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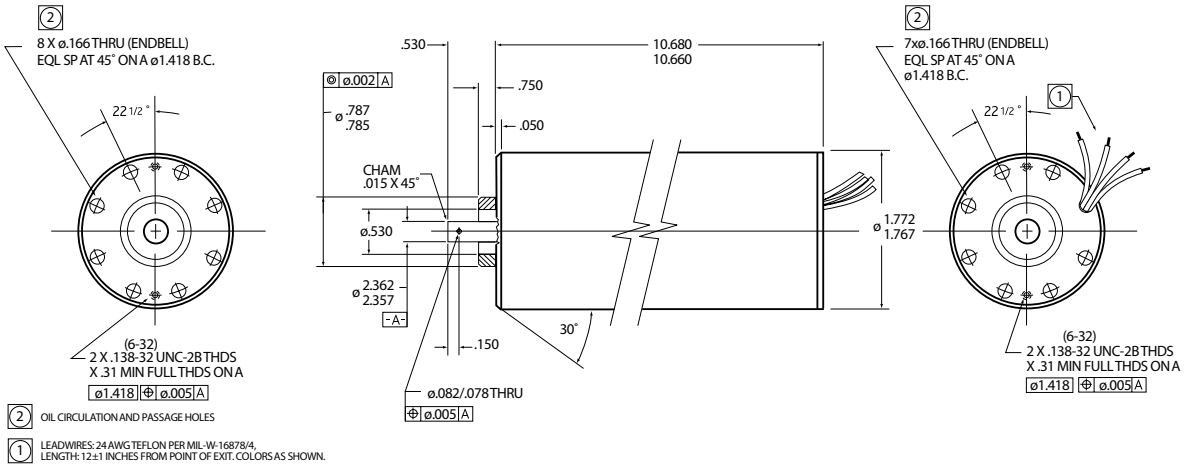
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 18HA10 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
MOTOR TYPE: SINGLE PHASE, PERMANENT SPLIT CAPACITOR (NOT SUPPLIED) REVERSIBLE, FOUR LEADS.	

INPUT:	
LINE VOLTAGE (Vrms)	240 TO 400
LINE FREQUENCY (Hz)	60
WAVE SHAPE (8% Max TOTAL HARMONICS DISTORTION)	SINUSOIDAL

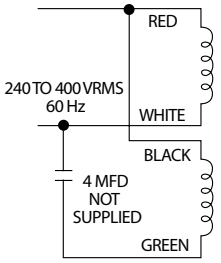
CONTINUOUS RUNNING:	
LINE CURRENT (A, Max)	1.1
SHAFT SPEED (rpm)	3450 ± 150

OPERATION UNDER LOAD:	
TORQUE LOAD (oz-in)	60
CURRENT (A, Max)	1.7
LINE VOLTAGE ADJUSTED AS REQUIRED FOR LOAD AND CURRENT	
POWER INPUT (LINE)(W, Max)	370
SHAFT SPEED (rpm, Min)	2,800

GENERAL DATA	
SHAFT END PLAY UNDER 3 lbs REVERSING GAGE LOAD	0.003 Max
DC RESISTANCE WITH UNIT AT 25°±5°C	
RED-WHITE(Ω)(±10%)	55
BLACK-GREEN(Ω)(±10%)	55

OPERATING ENVIRONMENT:
TOTAL IMMERSION HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200°C

CIRCUIT DIAGRAM
ROTATION SHALL BE CW AS VIEWED FROM SHAFT END. FOR CW ROTATION INTERCHANGE RED AND WHITE LEADS.



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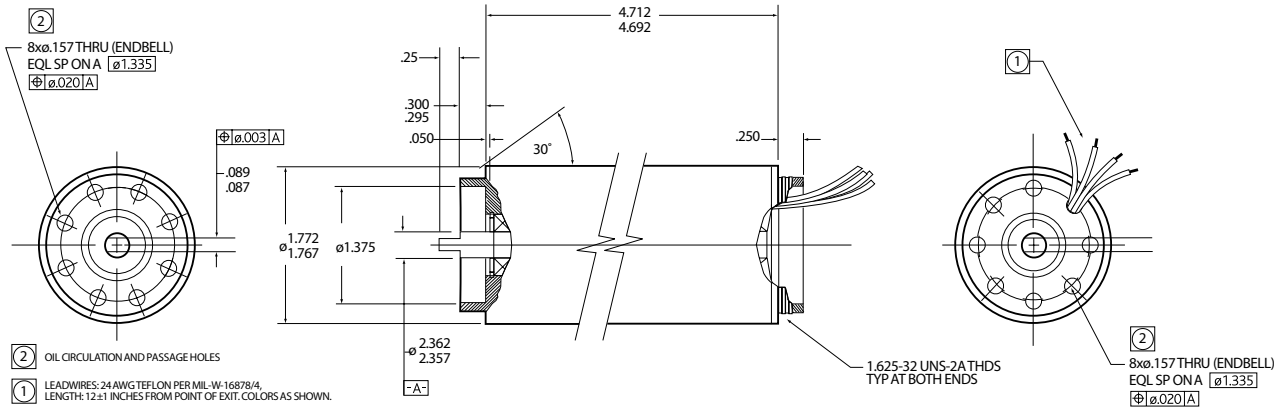
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 18HA11 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
MOTOR TYPE: SINGLE PHASE, PERMANENT SPLIT CAPACITOR (NOT SUPPLIED) REVERSIBLE, FOUR LEADS.	
NO LOAD OPERATION AT	115V ± 1V

INPUT:	
LINE VOLTAGE (Vrms)	115 TO 150
LINE FREQUENCY (Hz)	60
WAVE SHAPE (8% Max TOTAL HARMONICS DISTORTION)	SINUSOIDAL

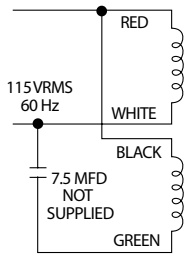
CONTINUOUS RUNNING:	
LINE CURRENT (A, Max)	0.57
SHAFT SPEED (rpm)	450±150

OPERATION UNDER LOAD:	
TORQUE LOAD (±0.1 oz-in)	16
CURRENT (±.05 A)	0.8
VOLTAGE ADJUSTED AS REQUIRED FOR LOAD AND CURRENT	
POWER INPUT (LINE)(W, Max)	15
SHAFT SPEED (rpm, Min)	2,800

GENERAL DATA	
SHAFT END PLAY UNDER 3 lbs REVERSING GAGE LOAD	0.003 Max
DC RESISTANCE WITH UNIT AT 25˚±5˚C	
RED-WHITE	36 Ω ±10%
BLACK-GREEN	36 Ω ±10%

OPERATING ENVIRONMENT:
TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM
ROTATION SHALL BE CW AS VIEWED FROM SHAFT END. FOR CW ROTATION INTERCHANGE WHITE AND RED LEADS.



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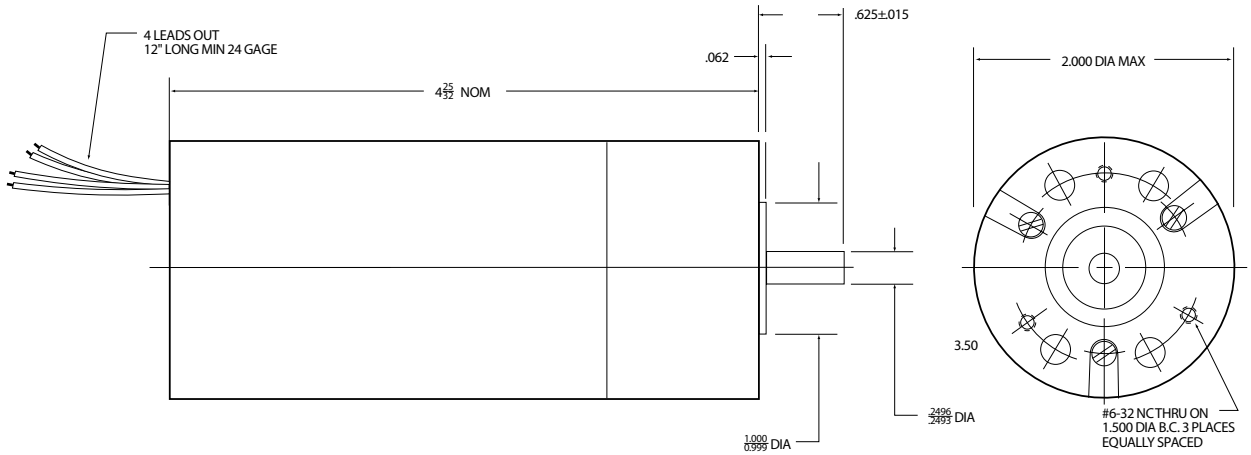
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 20HG1 SERIES

OUTLINE DRAWING

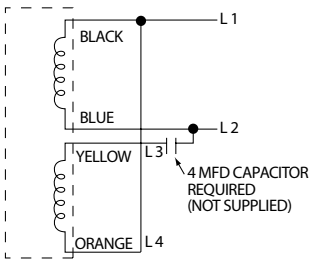


SPECIFICATIONS

NO LOAD OPERATION	
SINGLE PHASE	150 V, 60 Hz,
NOMINAL	80 oz-in
NOMINAL	0.6 A
rpm	360

OPERATING ENVIRONMENT:
OPERATIONAL UP TO 20,000 PSI AND HEATED UP TO 200˚C

WIRING DIAGRAM



CCW FACING SHAFT

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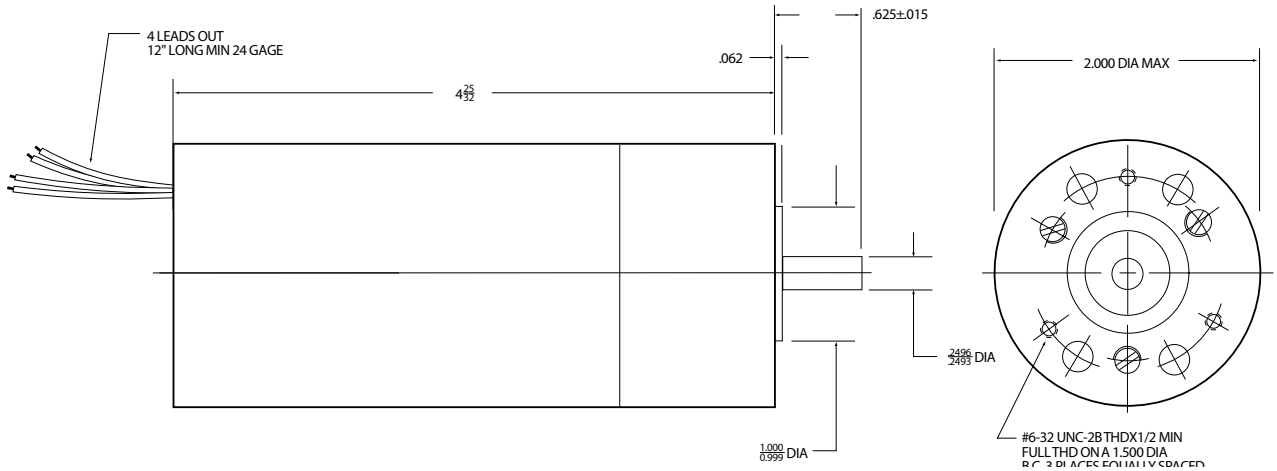
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 20HG2 SERIES

OUTLINE DRAWING

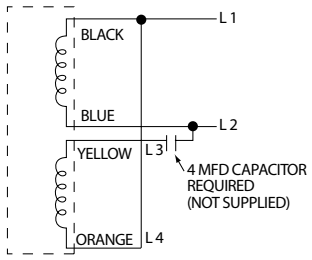


SPECIFICATIONS

NO LOAD OPERATION	
SINGLE PHASE	150 V, 60 Hz,
NOMINAL	48 oz-in
NOMINAL	0.5 A
rpm	600

OPERATING ENVIRONMENT:
OPERATING ENVIRONMENT UP TO 20,000 PSI AND HEATED UP TO 200˚C

WIRING DIAGRAM



CCW FACING SHAFT

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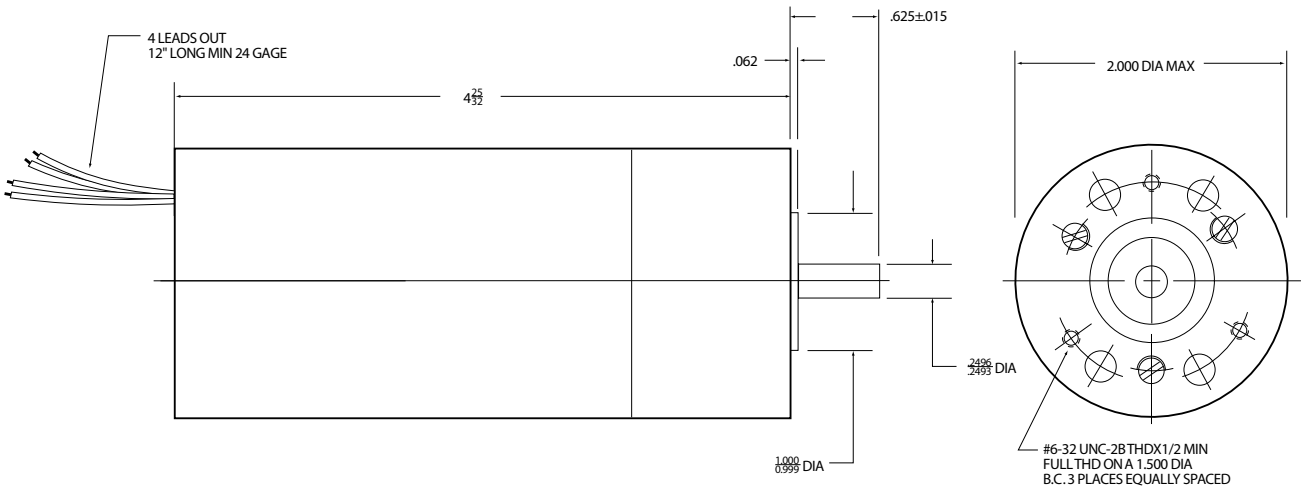
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 20HG3 SERIES

OUTLINE DRAWING

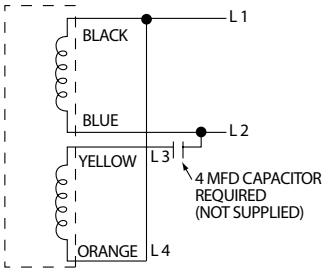


SPECIFICATIONS

NO LOAD OPERATION	
SINGLE PHASE	150 V, 60 Hz,
NOMINAL	48 oz-in
NOMINAL	0.5 A
rpm	1,200

OPERATING ENVIRONMENT:
OPERATING ENVIRONMENT UP TO 20,000 PSI AND HEATED UP TO 200˚C

WIRING DIAGRAM



CCW FACING SHAFT

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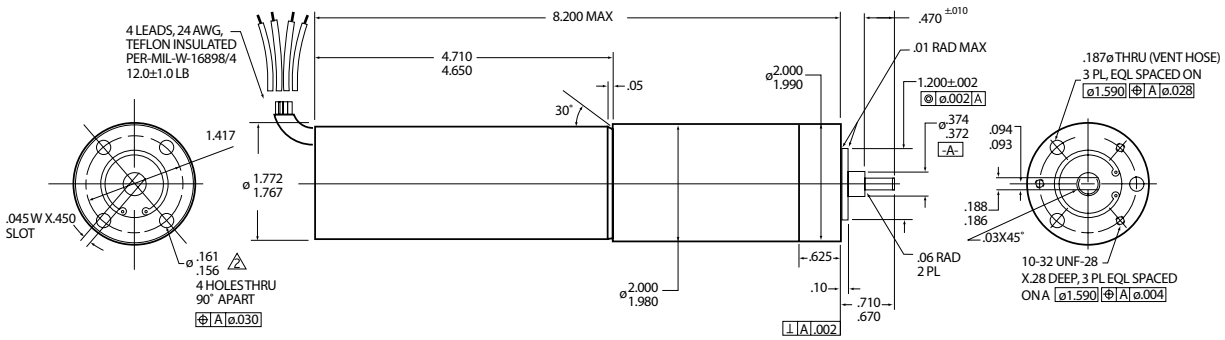
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 20HG5 SERIES

OUTLINE DRAWING



2 ORIENTATION OF HOLES AND LEADS TO OUTPUT MOUNTING HOLES OPTIONAL.

1. ALL VALUES ARE NOMINAL AT ROOM AMBIENT.

SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA (ROOM AMBIENT)	
MOTOR TYPE: SINGLE PHASE SPLIT CAPACITOR (NOT SUPPLIED) REVERSIBLE, FOUR LEADS	

NO LOAD OPERATION:	
LINE CURRENT (A, Max)	0.60
SHAFT SPEED (rpm)	14.0

INPUT:	
LINE VOLTAGE (Vrms)	115
LINE FREQUENCY (Hz)	60
WAVE SHAPE (5% Max TOTAL HARMONICS DISTORTION)	SINUSOIDAL

OPERATION AT STALL	
STALL TORQUE (oz-in, Min)	2,500
LINE CURRENT (A)(REF)	1.10
POWER INPUT (LINE)(W)(REF)	120

OPERATION UNDER LOAD:	
TORQUE LOAD (oz-in ± 150)	2,400
LINE CURRENT (A, Max)	.0.74
POWER INPUT (LINE)(W, Max)	70
SHAFT SPEED (rpm, Min)	12.0

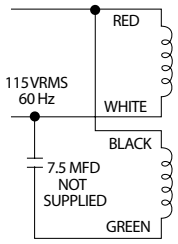
GENERAL DATA	
SHAFT END PLAY UNDER 3 lbs REVERSING GAGE LOAD	0.003 Max
DC RESISTANCE WITH UNIT AT 25˚±5˚C	
RED-WHITE	36 Ω ±10%
BLACK-GREEN	36 Ω ±10%
WEIGHT	64 oz

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

ROTATION SHALL BE CW AS VIEWED FROM THE OUTPUT SHAFT END. FOR CW ROTATION INTERCHANGE RED AND WHITE LEADS.



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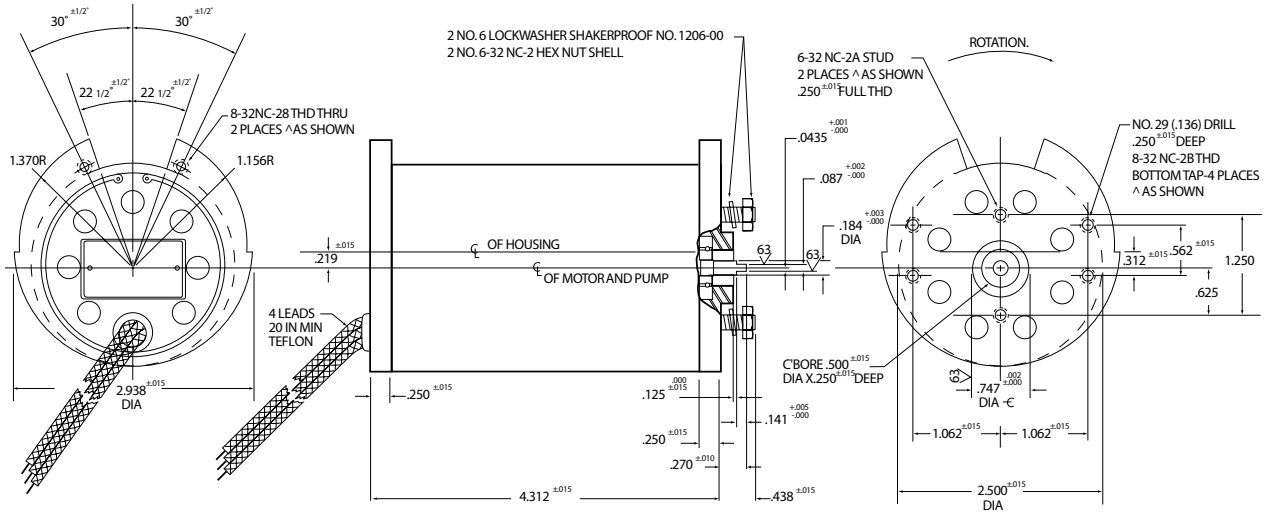
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 25HA2 SERIES

OUTLINE DRAWING



SPECIFICATIONS

GENERAL DATA

1- MOTOR; 115 (V), 60 CYCLE, 1 PHASE, 28 (in-oz), 1400 (rpm, Min) LOCKED ROTOR TORQUE=25 (in-oz), CLASS"W" INSULATION, SHAFT END PLAY =.004 - .010 PRELOAD .65 (A) NO LOAD, 1670 (Min), 1 (rpm) NO LOAD.

2- WITH C DIA STATIONARY RUNOUT OF SHAFT SHALL NOT EXCEED .0015 T.I.R.

3- WITH SHAFT STATIONARY RUNOUT OF C DIA SHALL NOT EXCEED .005 T.I.R. AND MOUNTING FACE MUST BE SQUARE WITH SHAFT WITHIN .002 T.I.R. AT 1.000 DIA

4- FINISH: NICKEL PENETRATE AS PER MIL-C-13924 CLASS 1

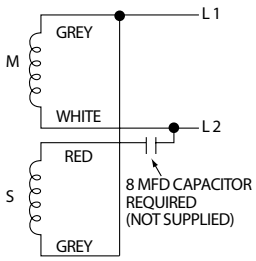
5- UNITS TO BE DIPPED IN HOT CAPELLAB OIL (140˚F APPROXIMATELY) DRAINED AND PLACED IN POLYETHYLENE BAGS.

6- WEIGHT: 4.5 lbs

7- INSULATION RESISTANCE W/W AND W/F 20 MEGAOHMS AT 500 (V)

8- SHAFT TONGUE: ROCKWELL C24-38 .500±.015 FROM END OF TONGUE

CONNECTION DIAGRAM



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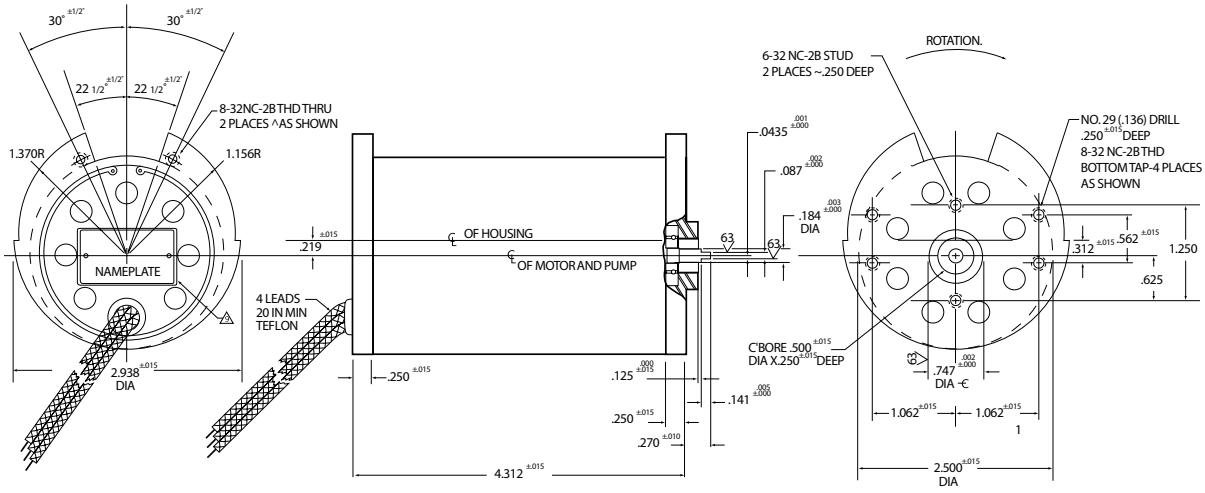
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 25HA5 SERIES

OUTLINE DRAWING



SPECIFICATIONS

GENERAL DATA

1- MOTOR;115 (V), 60 CYCLE, 1 PHASE, 28 (in-oz), 1,400 (rpm, Min) LOCKED ROTOR TORQUE=25 (in-oz), CLASS "H" INSULATION, SHAFT END PLAY=.000 - .010, PRELOAD, .65 (A) NO LOAD, 1670 Min, 1 (rpm) NO LOAD.

2- WITH C DIA STATIONARY RUNOUT OF SHAFT SHALL NOT EXCEED .0015 T.I.R.

3- WITH SHAFT STATIONARY RUNOUT OF C DIA SHALL NOT EXCEED .005 T.I.R. AND MOUNTING FACE MUST BE SQUARE WITH SHAFT WITHIN .002 T.I.R. AT 1.000 DIA

4- FINISH: NICKEL PENETRATE AS PER MIL-C-13924 CLASS 1

5- UNITS TO BE DIPPED IN HOT UNIVIS HYDRAULIC OIL (140˚F APPROXIMATELY) DRAINED AND PLACED IN POLYETHYLENE BAGS.

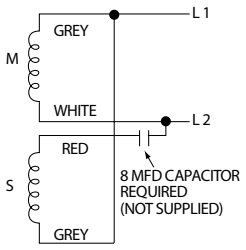
6- WEIGHT: 4.4 lbs

7- INSULATION RESISTANCE: W/W AND W/F 20 MΩ AT 500 (V)

8- SHAFT TONGUE: ROCKWELL C37-41 .500±.015 FROM END OF TONGUE

9- APPLY NAME PLATE P/N 200-1-31 USING DRIVE SCREWS P/N 21318-13

CONNECTION DIAGRAM



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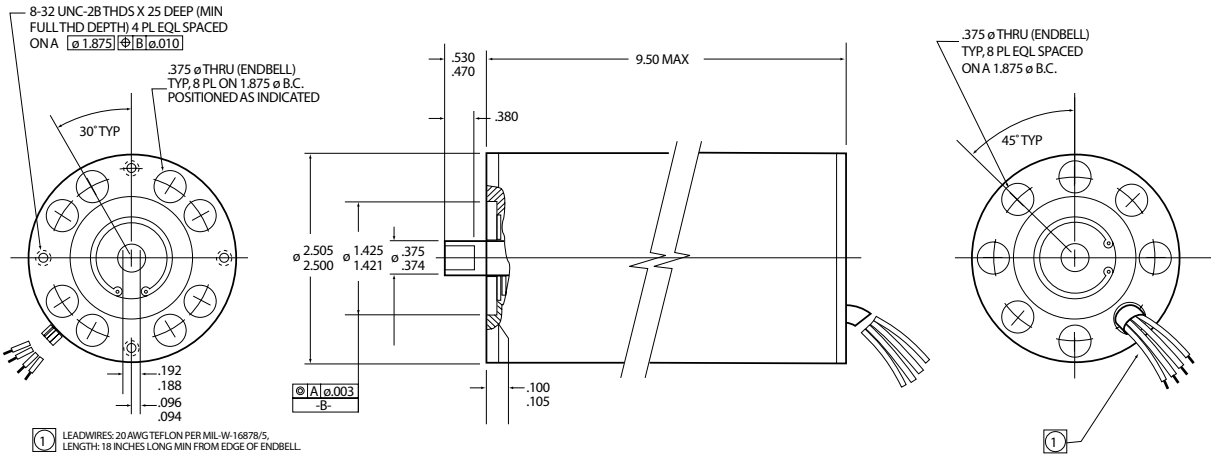
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 25HA6 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA	
NUMBER OF PHASES	1
LINE VOLTAGE(Vrms ± 10Vrms)	200
FREQUENCY (Hz ± 2Hz)	60
VOLTAGE WAVE SHAPE	SINUSOIDAL
VOLTAGE TOTAL HARMONICS DISTORTION (% Max)	8
OPERATION AT ROOM AMBIENT IN AIR	
FULL LOAD TORQUE STEADY STATE (oz-in, Min)	38
SPEED AT FULL LOAD TORQUE, STEADY STATE (rpm, Min)	3,150
CURRENT AT FULL LOAD TORQUE, STEADY STATE (Arms, Max)	0.75
STALL (STARTING) TORQUE (oz-in, Min)	15
STALL CURRENT (Arms, Max)	2.75

DUTY CYCLE AT ROOM AMBIENT IN AIR	
AT FULL LOAD (MINUTES)	5 Max"ON" 10 Min "OFF"
AT STALL (MINUTES)	2 Max "ON" 12 Min "OFF"

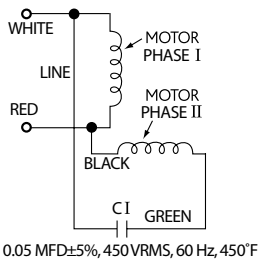
GENERAL DATA	
SHAFT END PLAY UNDER 3 lbs REVERSING GAGE LOAD	0.002/0.005
LIFE EXPECTANCY AT DOWN HOLE CONDITIONS 250 HOURS Min INCLUDING "OFF" TIME	
OPERATION ATTITUDE	VERTICAL, SHAFT EXTENSION DOWN
SHOCK	100g's FOR 10 MS ALONG ANY AXIS

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

ROTATION SHALL BE CCW AS VIEWED FROM SHAFT END. FOR CW ROTATION INTERCHANGE WHITE AND RED LEADS. CAPACITOR NOT SUPPLIED WITH UNIT.



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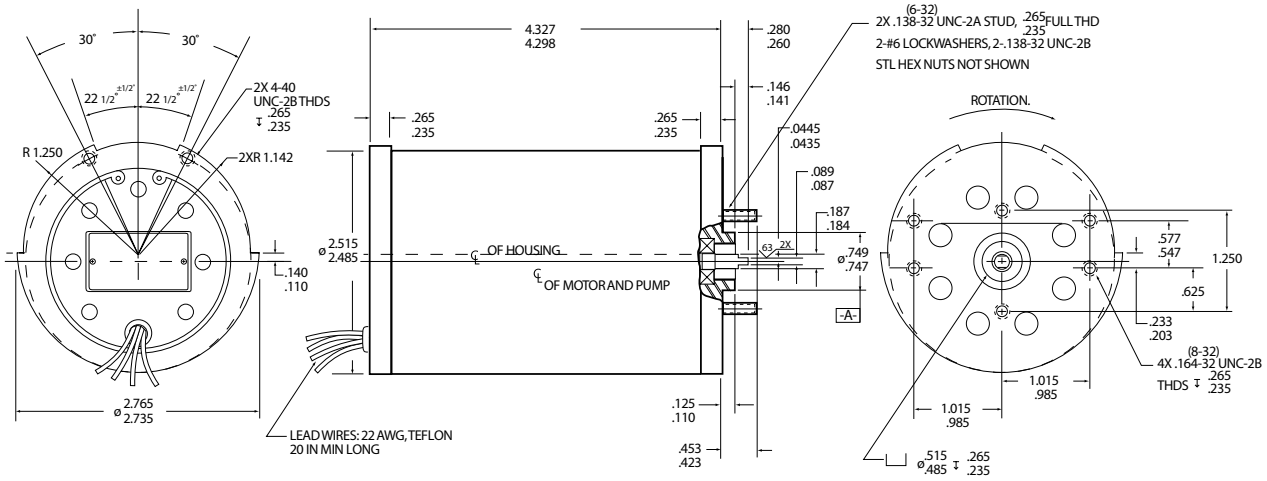
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 25HA7 SERIES

OUTLINE DRAWING



SPECIFICATIONS

GENERAL DATA

1- MOTOR; 115 (V), 60 (Hz), 1 PHASE, 28 (in-oz), 1,400 (rpm), 25 (in-oz, Min) LOCKED ROTOR TORQUE, .65 (A) AT 1670 (rpm, Min) NO LOAD, CLASS H INSULATION, SHAFT END PLAY .000 TO .010 PRELOADED, WEIGHT 4.5 lbs

2- INSULATION RESISTANCE: W/W AND W/F=20 MΩ AT 500 (V)

3- FINISH: NICKEL PENETRATE AS PER MIL-C-13924 CLASS 1

4- WITH A DIA STATIONARY RUNOUT OF SHAFT SHALL NOT EXCEED .0015 T.I.R.

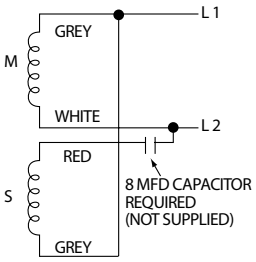
5- WITH SHAFT STATIONARY RUNOUT OF A DIA SHALL NOT EXCEED .005 T.I.R. AND MOUNTING FACE MUST BE SQUARE WITH SHAFT WITHIN .002 T.I.R. AT 1.000 DIA

6- SHAFT TONGUE: ROCKWELL C 24-28 .515/.485 FROM END OF TONGUE

7- UNITS TO BE DIPPED IN HOT CAPELLA B OIL (140˚F APPROXIMATELY) DRAINED AND PLACED IN POLYETHYLENE BAGS.

CONNECTION DIAGRAM

ROTATION SHALL BE CW AS VIEWED FROM SHAFT END. FOR CW ROTATION INTERCHANGE WHITE AND RED LEADS.



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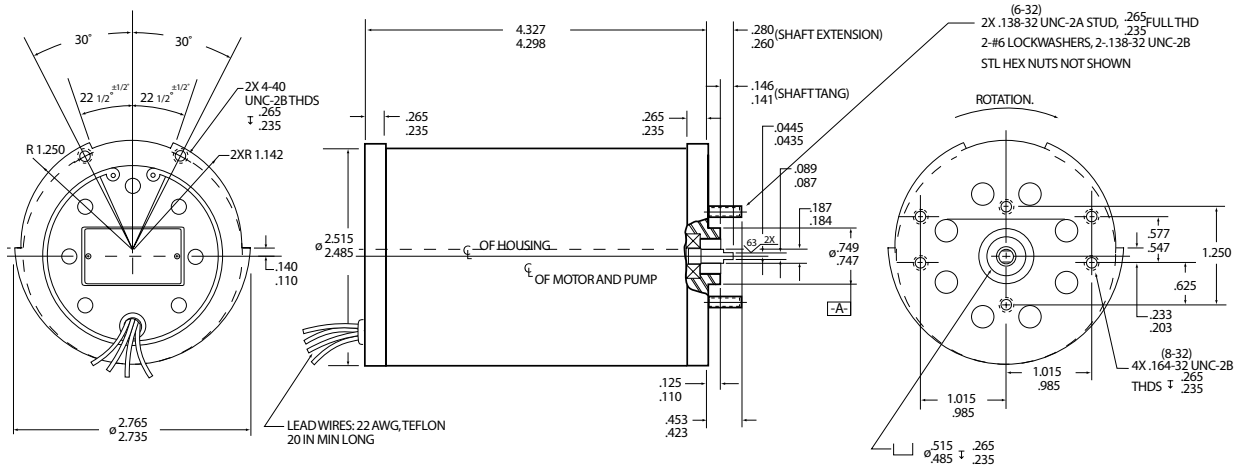
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 25HA8 SERIES

OUTLINE DRAWING



SPECIFICATIONS

GENERAL DATA

1- MOTOR; 250 (V), 60 (Hz), 1 PHASE, 28 (in-oz) AT 1,400 (rpm), 25 (in-oz, Min) LOCKED ROTOR TORQUE, .35 (A) AT 1670 (rpm, Min) NO LOAD, CLASS H INSULATION, SHAFT END PLAY .000 TO .010 PRELOADED, WEIGHT 4.5 lbs

2- INSULATION RESISTANCE W/W AND W/F=20 MΩ AT 500 (V)

3- FINISH: NICKEL PENETRATE AS PER MIL-C-13924 CLASS 1

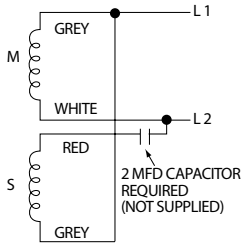
4- WITH A DIA STATIONARY RUNOUT OF SHAFT SHALL NOT EXCEED .0015 T.I.R.

5- WITH SHAFT STATIONARY RUNOUT OF A DIA SHALL NOT EXCEED .005 T.I.R. AND MOUNTING FACE MUST BE SQUARE WITH SHAFT WITHIN .002 T.I.R. AT 1.000 DIA

6- SHAFT TONGUE: ROCKWELL C 24-38 .515/.485 FROM END OF TONGUE

7- UNITS TO BE DIPPED IN HOT CAPELLA B OIL (140˚F APPROXIMATELY) DRAINED AND PLACED IN POLYETHYLENE BAGS.

CONNECTION DIAGRAM



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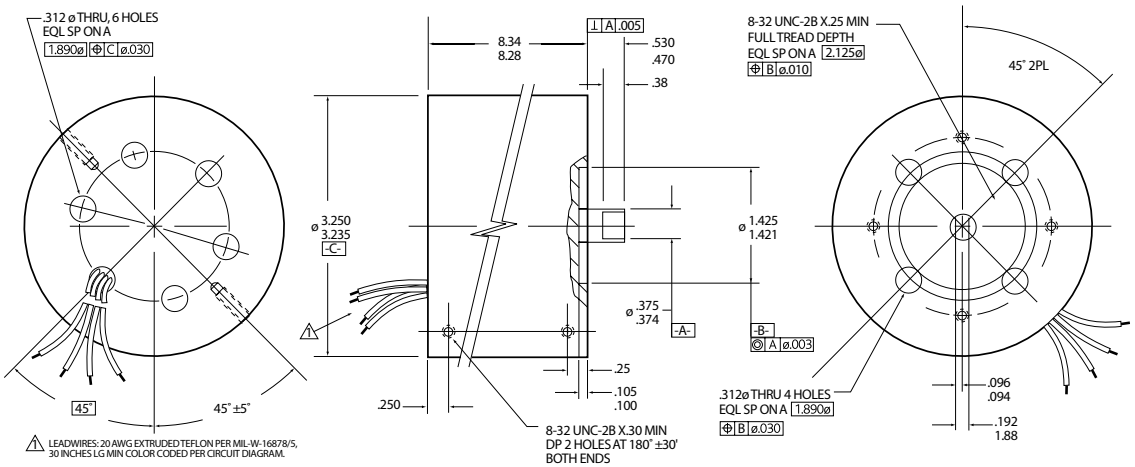
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 33HA5 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA		
NUMBER OF PHASES		1
LINE VOLTAGE(Vrms)		400
LINE FREQUENCY (Hz)		60
LINE VOLTAGE WAVE SHAPE		SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (% Max)		5
STARTING TORQUE(oz-in, Min)	82	
LINE CURRENT AT STARTING TORQUE (Arms, Max)		1.85
RUNNING TORQUE(oz-in)		80
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)		3.150
LINE CURRENT AT RUNNING TORQUE (Arms, Max)		1.0

DUTY CYCLES

INTERMITTENT: 5 MINUTES Max "ON" FOLLOWED BY 5 MINUTES "OFF" PERIOD

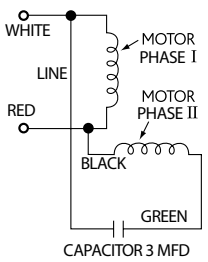
GENERAL DATA	
SHAFT END PLAY UNDER 8 lbs REVERSING GAGE LOAD	0.002/0.008
INSULATION: RESISTANCE WITH 500 VDC APPLIED. W/W AND EACH W/F (MΩ, Min).	100
DIALECTIC STRENGTH WITH 750 VRMS, 60 HZ APPLIED CURRENT	
LEAKAGE (µA, Max):	
W/W	250
BOTH WINDINGS CONNECTED TO FRAME	500

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

ROTATION SHALL BE CW AS VIEWED FROM SHAFT END.



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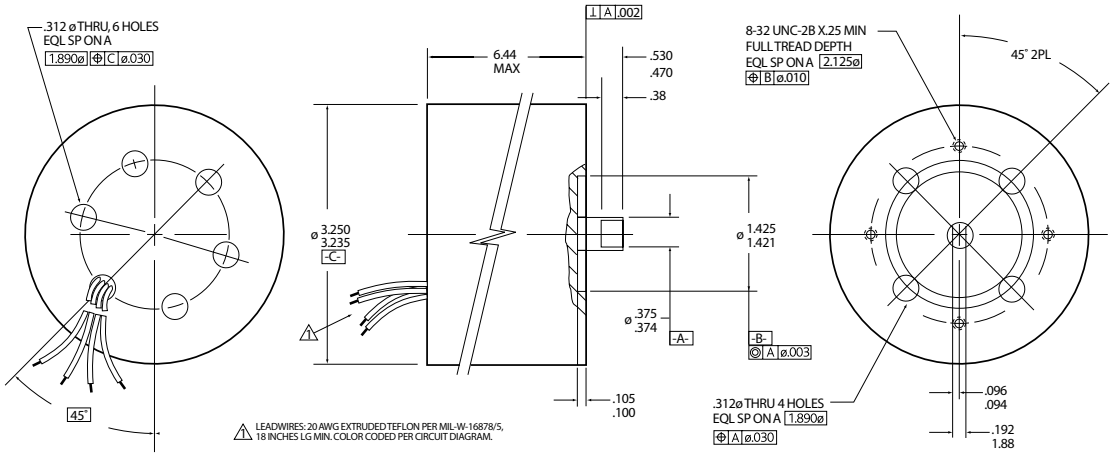
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 33HA6 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA	
NUMBER OF PHASES	1
LINE VOLTAGE(Vrms)	600
LINE FREQUENCY (Hz)	60
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (% Max)	5
STARTING TORQUE(oz-in, Min)	14.5
LINE CURRENT AT STARTING TORQUE (Arms, Max)	7.5
RUNNING TORQUE (oz-in)	54
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)	3,000
LINE CURRENT AT RUNNING TORQUE (Arms, Max)	0.4
DUTY CYCLES	CONTINUOUS

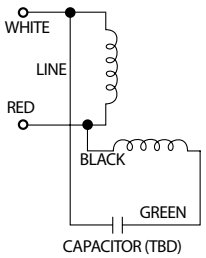
GENERAL DATA	
SHAFT END PLAY UNDER 8 lbs REVERSING GAGE LOAD	0.002/0.008

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

CCW ROTATION VIEWING THE MOTOR FROM SHAFT END. FOR CW ROTATION REVERSE WHITE AND RED LEADS (WHITE TO BLACK AND RED TO CAPACITOR LEAD) CAPACITOR (NOT SUPPLIED WITH MOTOR) .8 MFD ± 5%; 1000 VAC 60 Hz CONTINUOUS OPERATION.



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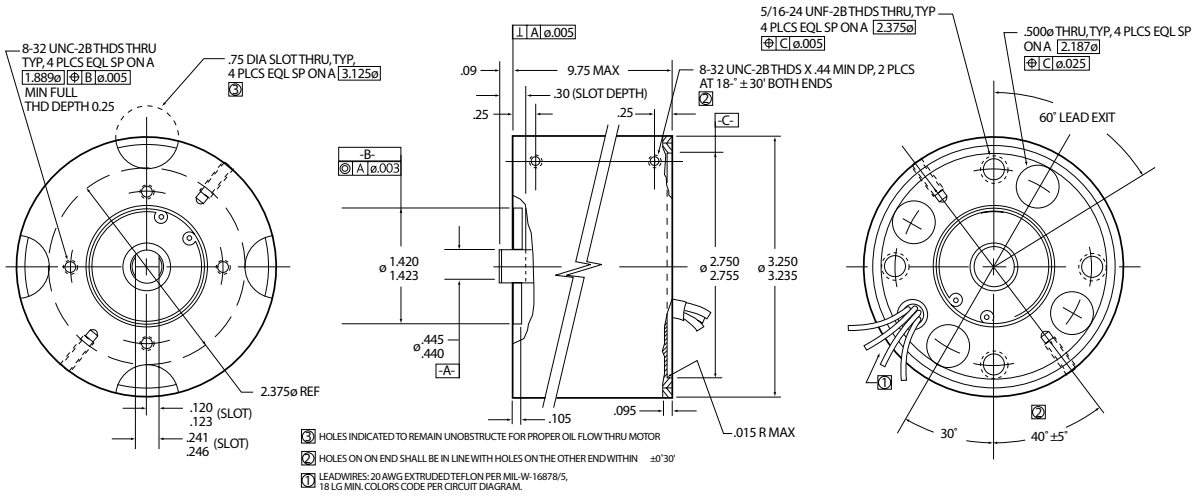
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 33HA7 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA	
NUMBER OF PHASES	1
LINE VOLTAGE(Vrms)	400
LINE FREQUENCY (Hz)	60
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (%Max)	5
STARTING TORQUE(oz-in, Min)	40
LINE CURRENT AT STARTING TORQUE (Arms, Max)	2.4
RUNNING TORQUE(oz-in)	125
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)	3,150
LINE CURRENT AT RUNNING TORQUE (Arms, Max)	1.1

DUTY CYCLES

INTERMITTENT: 1 MINUTES Max"ON" FOLLOWED BY 3 MINUTES "OFF" PERIOD

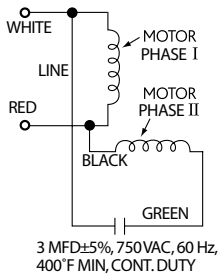
GENERAL DATA	
SHAFT END PLAY UNDER 8 lbs REVERSING GAGE LOAD	0.002/0.008
INSULATION: RESISTANCE WITH 500 VDC APPLIED. W/W AND EACH W/F (MΩ, Min).	100
DIALECTIC STRENGTH WITH 750 Vrms, 60 Hz APPLIED CURRENT	
LEAKAGE (μA, Max):	
W/W	250
BOTH WINDINGS CONNECTED TO FRAME	500

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

CCW ROTATION VIEWING THE MOTOR FROM SHAFT END. FOR CW ROTATION REVERSE WHITE AND RED LEADS (WHITE TO BLACK AND RED TO CAPACITOR LEAD). CAPACITOR NOT SUPPLIED WITH MOTOR.



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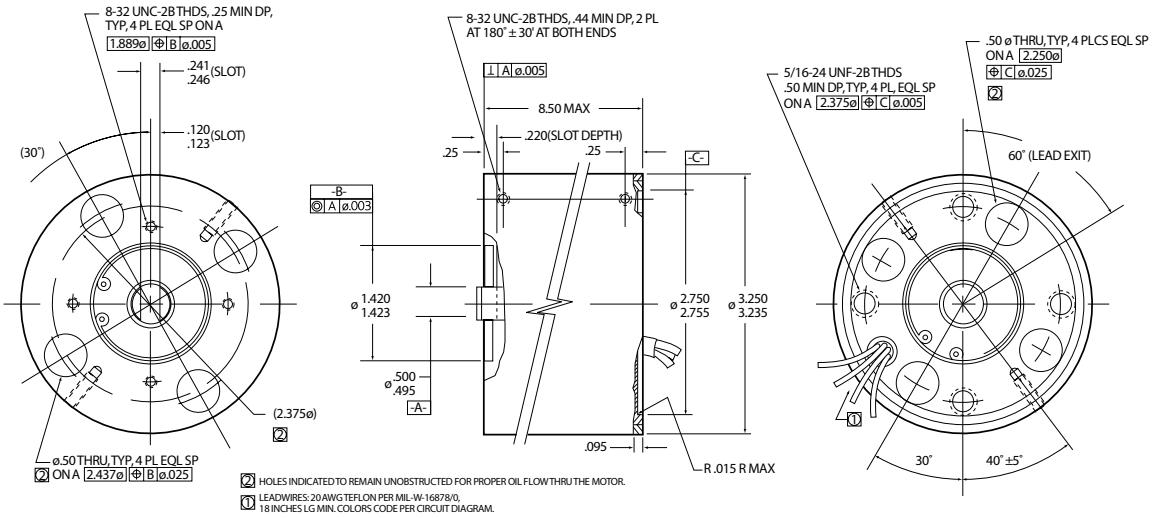
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 33HA8 SERIES

OUTLINE DRAWING



2 HOLES INDICATED TO REMAIN UNOBSTRUCTED FOR PROPER OIL FLOW THRU THE MOTOR.

1 LEADWIRES: 20 AWG TEFLON PER MIL-W-16878/0, 18 INCHES LG MIN. COLORS CODE PER CIRCUIT DIAGRAM.

SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA		
NUMBER OF PHASES		1
LINE VOLTAGE (Vrms)		400
LINE FREQUENCY (Hz)		60
LINE VOLTAGE WAVE SHAPE		SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)		5
STARTING TORQUE (oz-in, Min)	82	
LINE CURRENT AT STARTING TORQUE (Arms, Max)		1.85
RUNNING TORQUE (oz-in)		80
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)		3,150
LINE CURRENT AT RUNNING TORQUE (Arms, Max)		1.0

DUTY CYCLES

INTERMITTENT: 5 MINUTES Max "ON" FOLLOWED BY 5 MINUTES "OFF" PERIOD

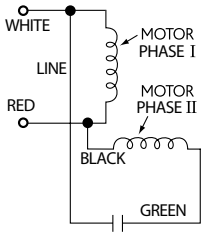
GENERAL DATA	
SHAFT END PLAY UNDER 8 lbs REVERSING GAGE LOAD	0.002/0.008

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

FOR CCW ROTATION VIEWING THE MOTOR FROM SHAFT END. FOR CW ROTATION REVERSE WHITE AND RED LEADS (WHITE TO BLACK AND RED TO CAPACITOR LEAD) CAPACITOR NOT SUPPLIED WITH MOTOR.



3 MFD±5%, 750 VAC, 60 Hz, 400˚F MIN, CONT. DUTY

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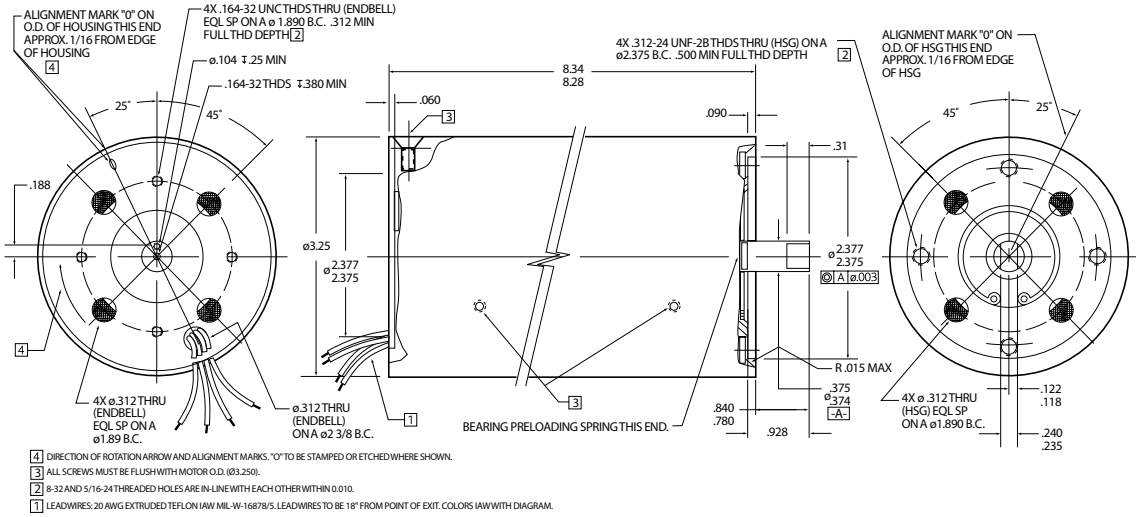
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 33HA10 SERIES

OUTLINE DRAWING



4 DIRECTION OF ROTATION ARROW AND ALIGNMENT MARKS. "O" TO BE STAMPED OR ETCHED WHERE SHOWN.
3 ALL SCREWS MUST BE FLUSH WITH MOTOR O.D. (Ø3.250).
2 8-32 AND 5/16-24 THREADED HOLES ARE IN-LINE WITH EACH OTHER WITHIN 0.010.
1 LEADWIRES: 20 AWG EXTRUDED TEFLON IAW MIL-W-16878/5. LEADWIRES TO BE 18" FROM POINT OF EXIT. COLORS IAW WITH DIAGRAM.

SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA	
VOLTAGE (V) (AC)	400
FREQUENCY (Hz)	60
SPEED AT 1/3 HP LOAD (rpm, Min)	2840
CURRENT AT 1/3 HP LOAD (A, Max)	1.1
POWER FACTOR AT 1/3 HP LOAD (Min)	0.9
RATED POWER (HP)	1/3
NUMBER OF PHASES	1
STALL TORQUE (oz-in, Min)	82
STALL CURRENT (A, Max)	1.85

STABILITY

MOTORS MUST OPERATE WITH 440 Ω IN SERIES AND EXHIBIT NO INSTABILITY IN SPEED, CURRENT OR VOLTAGE AT NO LOAD AND FULL LOAD CONDITION WITH 400 VOLTS

DIELECTRIC STRENGTH

W/W: 750 VAC, 60 Hz, 10 Sec Max LEAKAGE 250 MICROAMPS BOTH WINDING CONNECTED TOGETHER TO FRAME: 750 VAC, 60 Hz, 10 (Sec Max) LEAKAGE 500 MICROAMPS

GENERAL DATA

SHAFT END PLAY UNDER 8 lbs REVERSING GAGE LOAD	0.002/0.008

UNITS TO BE SEALED IN A POLYETHYLENE BAG

DC RESISTANCE WITH UNIT AT 25˚±5˚C

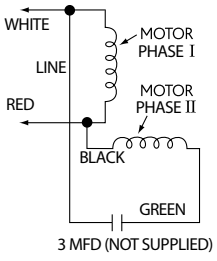
RED-WHITE	58 Ω ±10%
BLACK-GREEN	65 Ω ±10%

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

FOR CCW ROTATION VIEWING THE MOTOR FROM SHAFT END.



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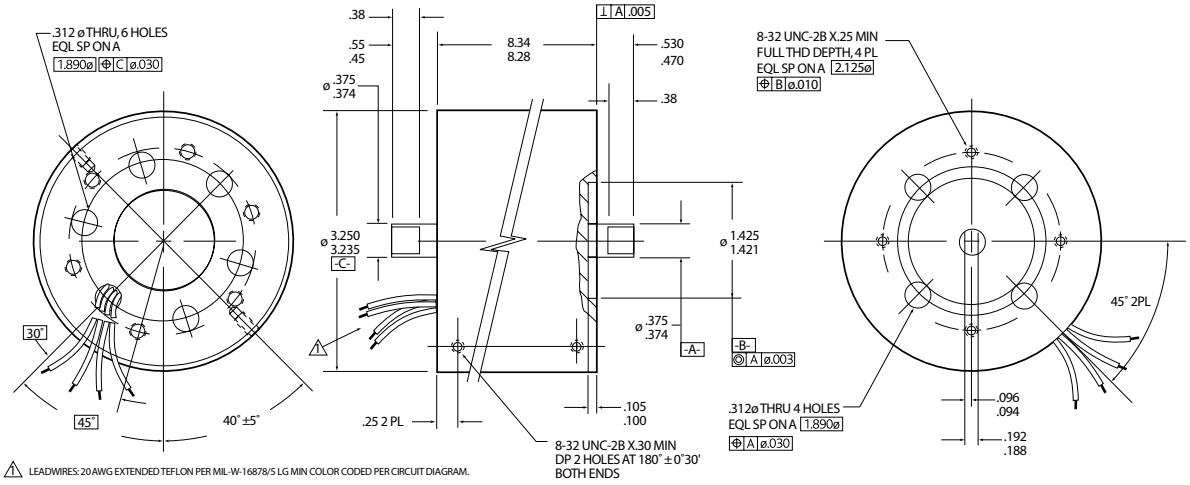
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 33HA11 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA	
NUMBER OF PHASES	1
LINE VOLTAGE (Vrms)	400
LINE FREQUENCY (Hz)	60
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)	5
STARTING TORQUE (oz-in, Min)	82
LINE CURRENT AT STARTING TORQUE (Arms, Max)	1.85
RUNNING TORQUE (oz-in)	80
SHAFT SPEED AT RUNNING TORQUE (rpm,Min)	3,150
LINE CURRENT AT RUNNING TORQUE (Arms, Max)	1.0

DUTY CYCLES

INTERMITTENT, 5 MINUTES Max "ON" FOLLOWED BY 5 MINUTES Min "OFF" PERIOD

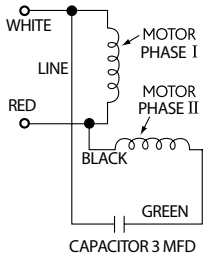
GENERAL DATA	
SHAFT END PLAY UNDER 8 lbs REVERSING GAGE LOAD	0.002/0.008

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

CCW ROTATION VIEWING THE MOTOR FROM SHAFT END. FOR CW ROTATION REVERSE WHITE AND RED LEADS (WHITE TO BLACK AND RED TO CAPACITOR LEAD). CAPACITOR NOT SUPPLIED WITH MOTOR.



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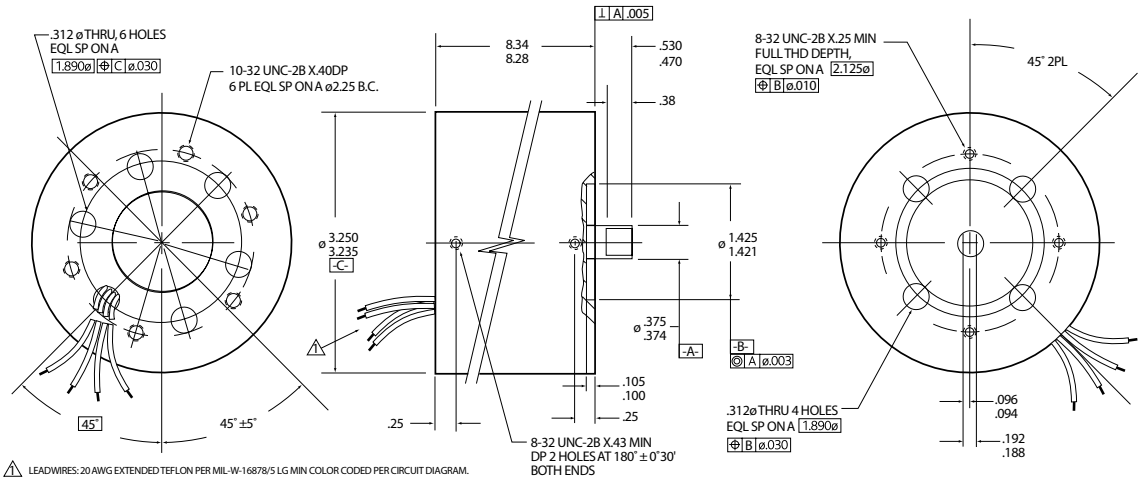
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 33HA13 SERIES

OUTLINE DRAWING



SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA	
NUMBER OF PHASES	1
LINE VOLTAGE (Vrms)	400
LINE FREQUENCY (Hz)	60
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)	5
STARTING TORQUE (oz-in, Min)	82
LINE CURRENT AT STARTING TORQUE (Arms, Max)	1.85
RUNNING TORQUE (oz-in)	80
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)	3,150
LINE CURRENT AT RUNNING TORQUE (Arms, Max)	1.0

DUTY CYCLES

INTERMITTENT, 5 MINUTES Max "ON" FOLLOWED BY 5 MINUTES Min "OFF" PERIOD

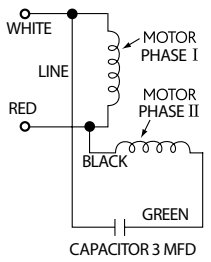
GENERAL DATA	
SHAFT END PLAY UNDER 8 lbs REVERSING GAGE LOAD	0.002/0.008
INSULATION: RESISTANCE WITH 500 VDC APPLIED. W/W AND EACH W/F (MΩ, Min).	100
DIALECTIC STRENGTH WITH 750 Vrms, 60 Hz APPLIED CURRENT	
LEAKAGE (µA Max):	
W/W	250
BOTH WINDINGS CONNECTED TO FRAME	500

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

FOR CCW ROTATION VIEWING THE MOTOR FROM SHAFT END. FOR CW ROTATION REVERSE WHITE AND RED LEADS (WHITE TO BLACK AND RED TO CAPACITOR LEAD). CAPACITOR NOT SUPPLIED WITH MOTOR.



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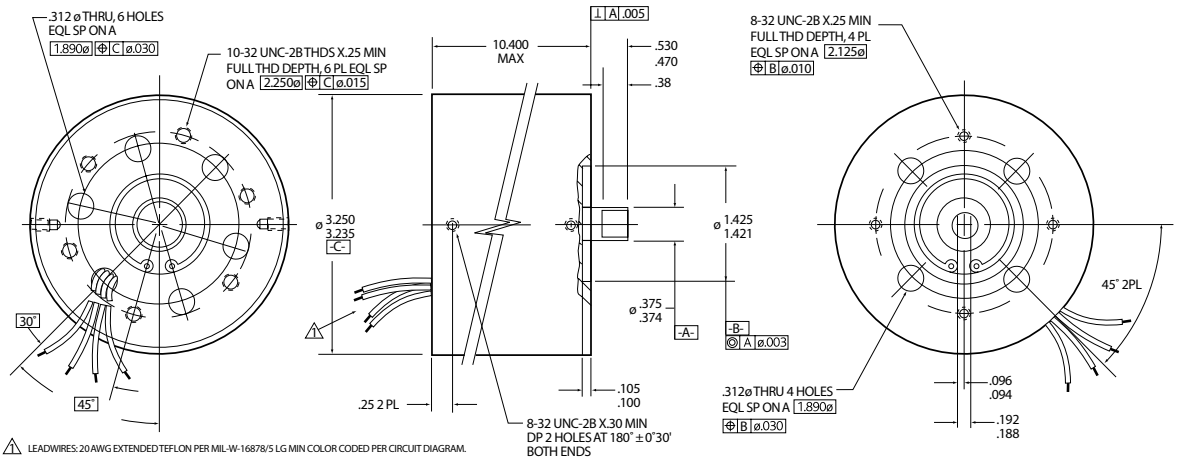
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 33HA14 SERIES

OUTLINE DRAWING



SPECIFICATIONS

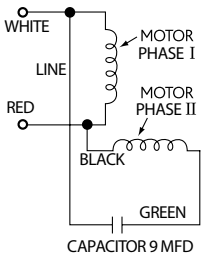
ELECTRICAL AND PERFORMANCE DATA	
NUMBER OF PHASES	1
LINE VOLTAGE (Vrms)	400
LINE FREQUENCY (Hz)	60
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)	5
STARTING TORQUE (oz-in, REP)	85
LINE CURRENT AT STARTING TORQUE (Arms)(REP)	4.4
RUNNING TORQUE (oz-in)	340 ± 20%
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)	3,000
LINE CURRENT AT RUNNING TORQUE (Arms, Max)	3.0
EFFICIENCY (PERCENT)(Min)	65
OUTPUT POWER (HP)	1 ± 10%

DUTY CYCLES
INTERMITTENT, 5 MINUTES Max “ON” FOLLOWED BY 5 MINUTES Min”OFF” PERIOD

GENERAL DATA	
SHAFT END PLAY UNDER 8 lbs REVERSING GAGE LOAD	0.002/0.008
UNITS TO BE SEALED IN A POLYETHYLENE BAG	
UNIT WEIGHT (lbs)	17

OPERATING ENVIRONMENT:
TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM
CCW ROTATION VIEWING THE MOTOR FROM SHAFT END. FOR CW ROTATION REVERSE WHITE AND RED LEADS (WHITE TO BLACK AND RED TO CAPACITOR LEAD). CAPACITOR NOT SUPPLIED WITH MOTOR.



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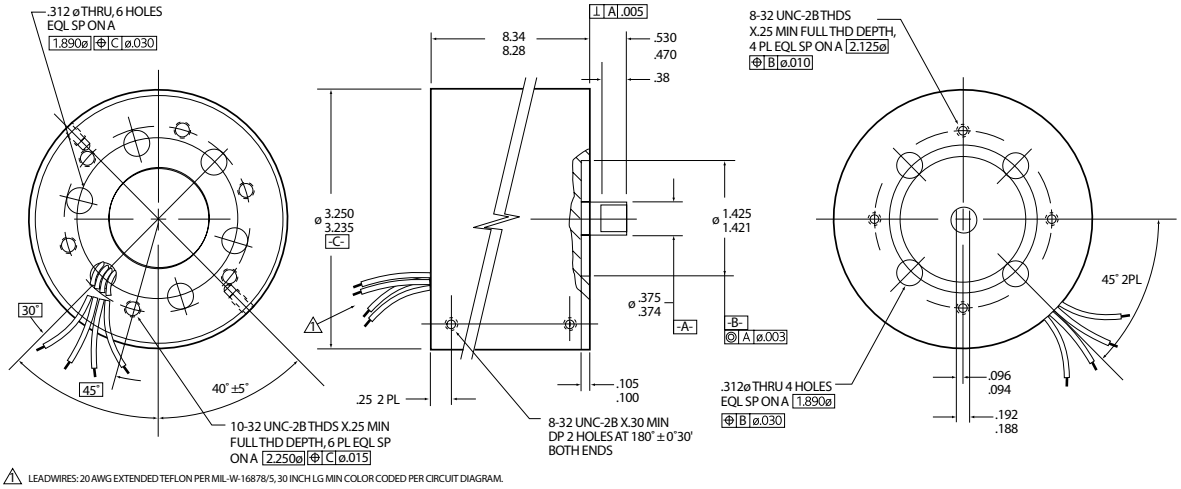
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 33HA15 SERIES

OUTLINE DRAWING



⚠1 LEADWIRES: 20 AWG EXTENDED TEFLON PER MIL-W-16878/5, 30 INCH LG MIN COLOR CODED PER CIRCUIT DIAGRAM.

SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA	
NUMBER OF PHASES	1
LINE VOLTAGE (Vrms)	400
LINE FREQUENCY (Hz)	60
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)	5
STARTING TORQUE (oz-in)(REF)	128
LINE CURRENT AT STARTING TORQUE (Arms)(REF)	2.8
RUNNING TORQUE (oz-in)	120
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)	3,000
LINE CURRENT AT RUNNING TORQUE (Arms, Max)	1.7

DUTY CYCLES

INTERMITTENT, 5 MINUTES Max "ON" FOLLOWED BY 5 MINUTES Min "OFF" PERIOD

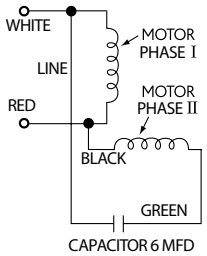
GENERAL DATA	
SHAFT END PLAY UNDER 8 lbs REVERSING GAGE LOAD	0.002/0.008

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

CCW ROTATION VIEWING THE MOTOR FROM SHAFT END. FOR CW ROTATION REVERSE WHITE ANDRED LEADS (WHITE TO BLACK ANDRED TO CAPACITOR LEAD). CAPACITOR NOT SUPPLIED WITH MOTOR.



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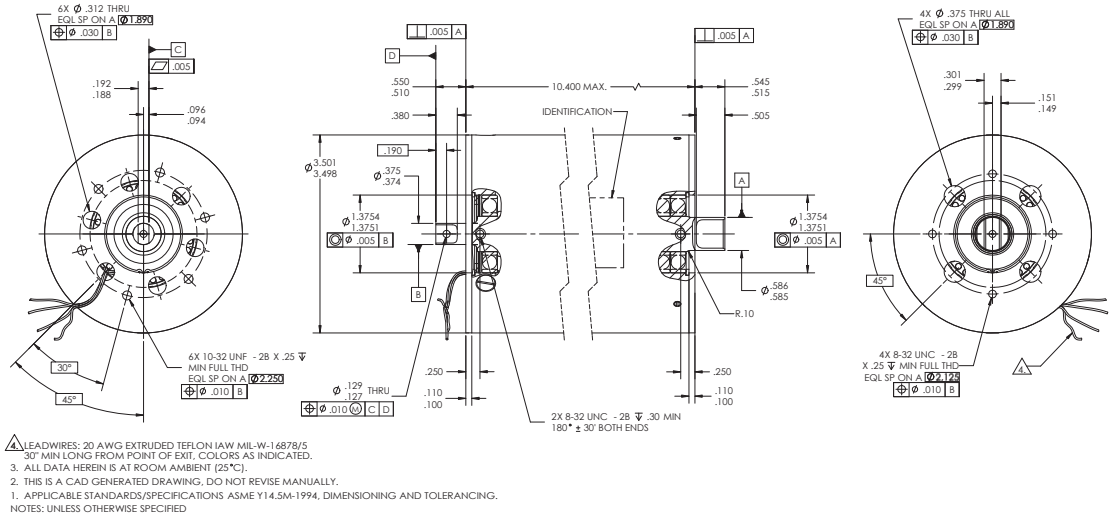
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 35HAX SERIES

OUTLINE DRAWING



4. LEADWIRES: 20 AWG EXTRUDED TEFLON IAW MIL-W-16878/5
30" MIN LONG FROM POINT OF EXIT. COLORS AS INDICATED.
3. ALL DATA HEREIN IS AT ROOM AMBIENT (25°C).
2. THIS IS A CAD GENERATED DRAWING, DO NOT REVISE MANUALLY.
1. APPLICABLE STANDARDS/SPECIFICATIONS ASME Y14.5M-1994, DIMENSIONING AND TOLERANCING.
NOTES: UNLESS OTHERWISE SPECIFIED

SPECIFICATIONS

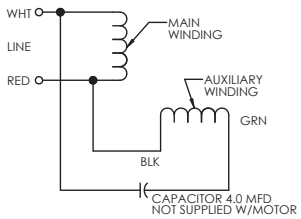
ELECTRICAL AND PERFORMANCE DATA	
NUMBER OF PHASES	1
LINE VOLTAGE (Vrms)	600
LINE FREQUENCY (Hz)	60
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)	5
STARTING TORQUE (oz-in)(REF)	85
LINE CURRENT AT STARTING TORQUE (A)(Max)	5.0
RUNNING TORQUE (oz-in)	320 ± 20%
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)	3,000
LINE CURRENT AT RUNNING TORQUE (Arms, Max)	2.0
EFFICIENCY (PERCENT, Nom)	70
OUTPUT POWER (Hp)	1.0 ± 10%

GENERAL DATA	
SHAFT END PLAY UNDER 16 lbs REVERSING GAGE LOAD	0.002/0.008
UNIT WEIGHT (lbs)	22
DUTY CYCLE AND HEAT REMOVAL RATE AT END USER DISCRETION	

OPERATING ENVIRONMENT:	
WINDING TEMPERATURE (Max)	500°F

CIRCUIT DIAGRAM

CCW ROTATION VIEWING THE MOTOR FROM SHAFT END. FOR CW ROTATION REVERSE WHITE AND RED LEADS (WHITE TO BLACK AND RED TO CAPACITOR LEAD).



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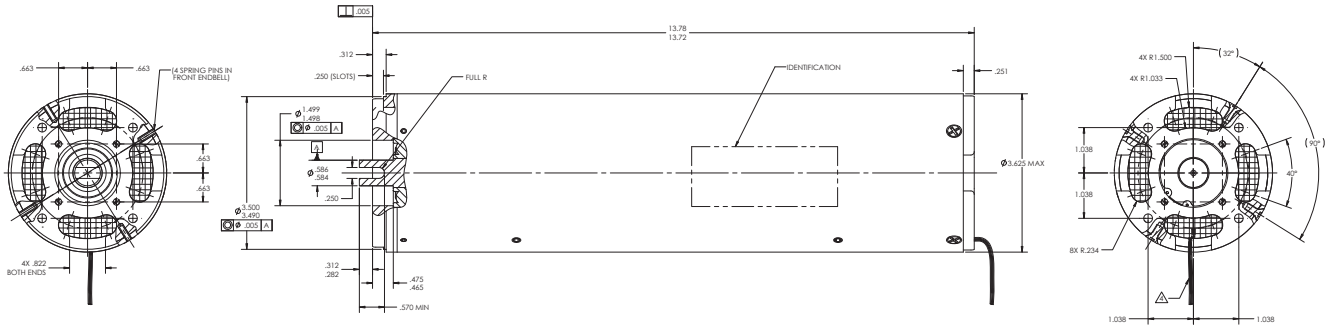
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 37HAX SERIES

OUTLINE DRAWING



SPECIFICATIONS

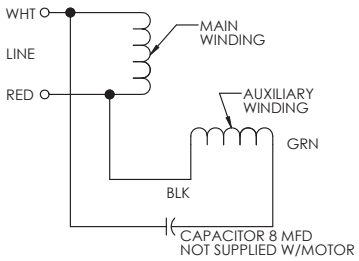
ELECTRICAL AND PERFORMANCE DATA	
NUMBER OF PHASES	1
LINE VOLTAGE (Vrms)	600
LINE FREQUENCY (Hz)	60
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)	5
STARTING TORQUE (oz-in)(REF)	120
LINE CURRENT AT STARTING TORQUE (A)(Max)	10.0
RUNNING TORQUE (oz-in)	480
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)	3,300
LINE CURRENT AT RUNNING TORQUE (Arms, Max)	3.0
EFFICIENCY (PERCENT, Nom)	75
OUTPUT POWER (Hp)	1.5

GENERAL DATA	
SHAFT END PLAY UNDER 16 lbs REVERSING GAGE LOAD	0.002/0.008
UNIT WEIGHT (lbs)	30
DUTY CYCLE AND HEAT REMOVAL RATE AT END USER DISCRETION	

OPERATING ENVIRONMENT:	
WINDING TEMPERATURE (Max)	500˚F

CIRCUIT DIAGRAM

CCW ROTATION VIEWING THE MOTOR FROM SHAFT END. (OPP LEADS) FOR CW ROTATION REVERSE WHITE AND RED LEADS (WHITE TO GREEN AND RED TO CAPACITOR LEAD).



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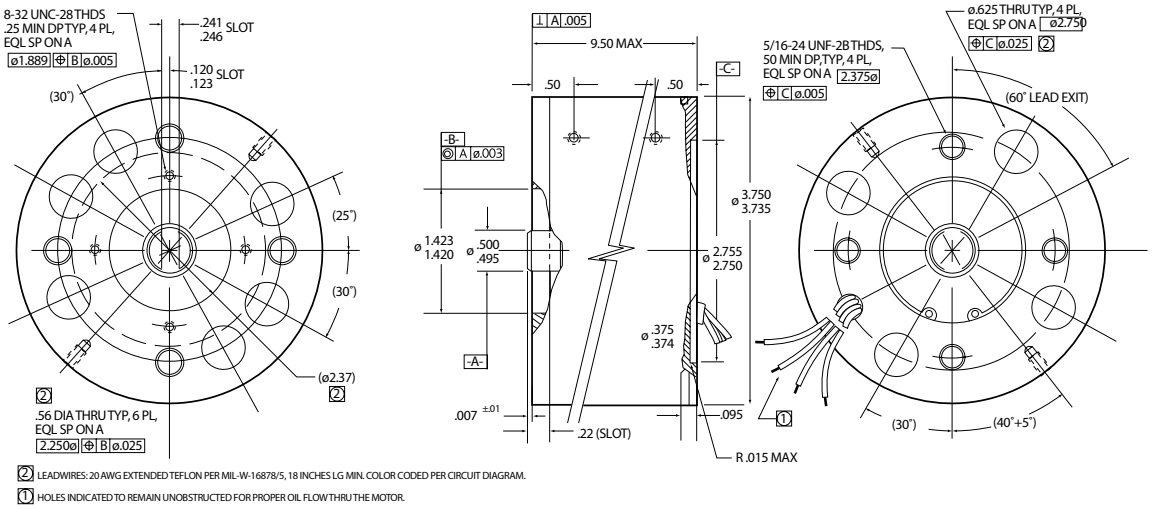
HIGH TEMPERATURE & HIGH PRESSURE AC INDUCTION MOTOR 38HA2 SERIES

OUTLINE DRAWING



2 LEADWIRES: 20 AWG EXTENDED TEFLON PER MIL-W-16878/5, 18 INCHES LG MIN. COLOR CODED PER CIRCUIT DIAGRAM.

1 HOLES INDICATED TO REMAIN UNOBSTRUCTED FOR PROPER OIL FLOW THRU THE MOTOR.

SPECIFICATIONS

ELECTRICAL AND PERFORMANCE DATA	
NUMBER OF PHASES	1
LINE VOLTAGE (Vrms)	400
LINE FREQUENCY (Hz)	60
LINE VOLTAGE WAVE SHAPE	SINUSOIDAL
LINE VOLTAGE TOTAL HARMONICS DISTORTION (Max)	5
STARTING TORQUE (oz-in, Min)	40
LINE CURRENT AT STARTING TORQUE (Arms, Max)	2.7
RUNNING TORQUE (oz-in)	135
SHAFT SPEED AT RUNNING TORQUE (rpm, Min)	1,350
LINE CURRENT AT RUNNING TORQUE (Arms, Max)	1.1

DUTY CYCLES

INTERMITTENT, 1 MINUTES Max "ON" FOLLOWED BY 3 MINUTES Min "OFF" PERIOD

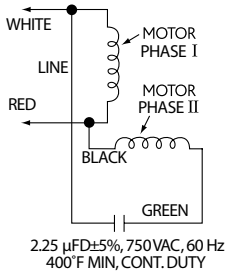
GENERAL DATA	
SHAFT END PLAY UNDER 8 lbs REVERSING GAGE LOAD	0.002/0.005

OPERATING ENVIRONMENT:

TOTAL IMMERSION IN HYDRAULIC OIL PRESSURIZED UP TO 20,000 PSI AND HEATED UP TO 200˚C

CIRCUIT DIAGRAM

CCW ROTATION VIEWING THE MOTOR FROM SHAFT END. FOR CW ROTATION REVERSE WHITE AND RED LEADS (WHITE TO BLACK AND RED TO CAPACITOR LEAD). CAPACITOR NOT SUPPLIED WITH MOTOR.



2.25 µFD±5%, 750 VAC, 60 Hz
400˚F MIN, CONT. DUTY