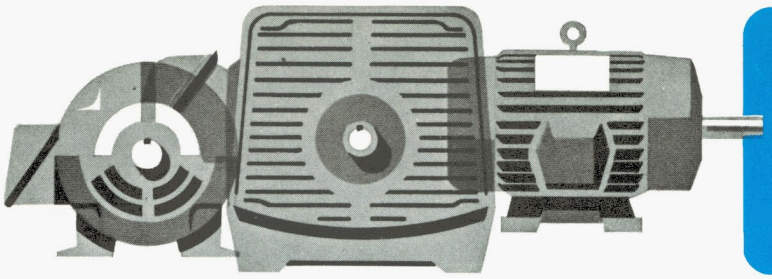
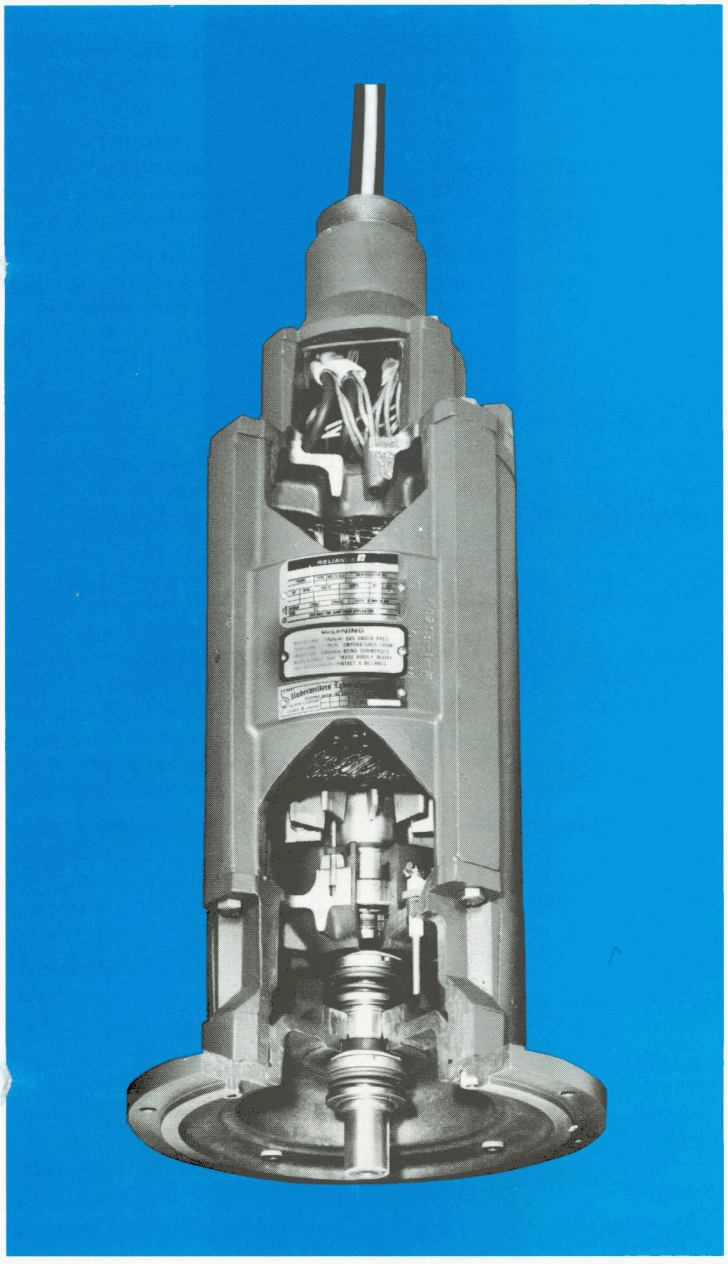


RELIANCE
DUTY MASTER
A-C MOTORS

Submersible Sewage Pump Motors

U L Listed for Use in Class I Groups C and D Hazardous Locations in Air or Submersible in Water and Sewage

- 1/2 - 135 HP Polyphase
- 3/4 - 5 HP Single Phase
- **Moisture Detector and Thermal Protection Standard**
- **UL Listed Explosion-Proof for Hazardous Wet Pit Locations**



Facts About Wet Well Applications

Reliance Electric Duty Master submersible AC motors bring quality and reliability to submersible sewage wet well motor applications.

Sewage wet wells are known to routinely contain explosive gases and vapors. (For a complete listing see Water Pollution Control Federation Manual of Practice No. 1, Safety and Wastewater Works, pages 44 & 45, 1975 edition.)

Such locations are defined by the National Electric Code as Class I; Division I, Hazardous Locations. Section 501-8 (a) of the NEC requires that motors be designed for the location e.g. explosion proof.

The U.S. Department of Labor (OSHA) has classified all wet wells which handle wastewater containing organic matter as Class I, Division I, Hazardous Locations.

For a listing of explosions occurring in wastewater collection system locations, see appendix b, NFPA bulletin No. 328, 1975 edition.

Reliance submersible motors are UL listed for Class I, Groups C and D in air or submersible in water or sewage. All Reliance submersible motors include thermal devices as standard. These devices are required by UL on all motors 1 HP and larger. These devices are not recognized by UL for motors less than 1 HP but are included by Reliance Electric for additional motor protection. Motors less than 1 HP are supplied with a cautionary label and are suitable on applications where vapor or gas ignition temperatures exceed 280°C. These motors are listed Class I, Group D only.

Reliance Electric stocks common ratings through 100 HP continuous duty submerged in liquid, 15 minutes duty in air at nameplate horsepower, and continuous duty in air at a reduced load. Other designs through 135 HP and special continuous in air ratings are also available.

Application of this motor product for continuous in-gases operation must be done in compliance with Reliance Electric bulletin B-3629 (latest revision).

The thermostats are automatic reset for use in normally closed circuit where the thermostat is connected in series with the holding coil of the magnetic starter. When excessive heat occurs, it causes the thermostat to open the circuit of the holding coil of the magnetic starter stopping the motor.

Use of the thermostats is required and limited to control circuits in which the maximum current does not exceed the following values:

Volts	Amps	Inrush Amps
110-220	3.0	30.0
220-240	1.5	15.0
440-490	0.75	7.5
550-600	0.6	6.0

The complete line of Duty Master Submersible Pump Motors includes single phase motors from 3/4 to 5 HP and polyphase motors in 1/2 to 135 HP ratings. Single phase motors have control panels which include auxiliary starting capacitors and connection terminal strip. Most stock motors are dual voltage with reconnectable leads.

Motor listing by Underwriters Laboratories requires that any servicing of this product be done at a UL listed, Reliance Electric approved service center, if UL listing is to be maintained.

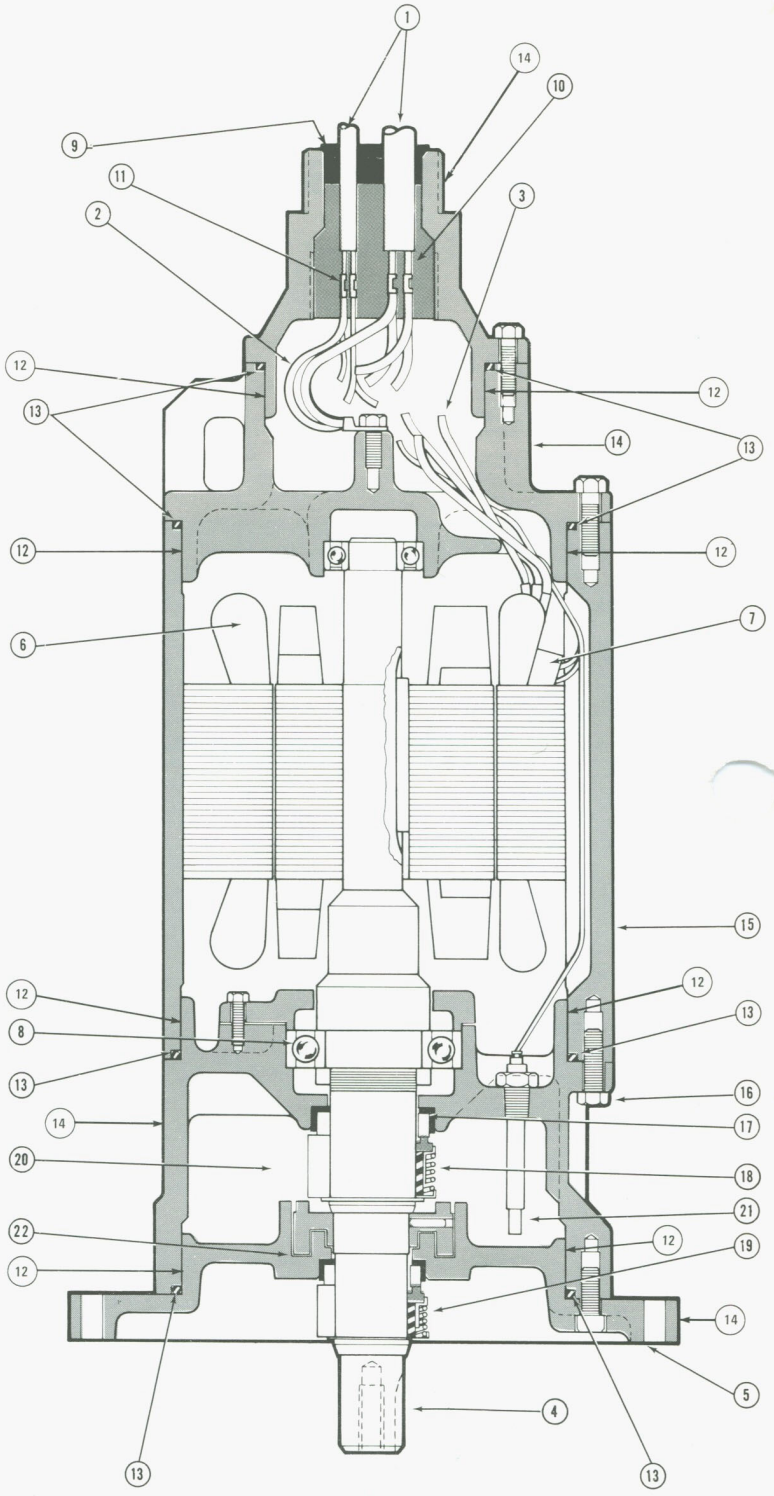
Standard NEMA Design B torque electrical designs are used throughout. Bearings are pre-lubricated at the factory and designed for a minimum L-10 life of 17,500 hours at maximum continuous duty load. A locked shaft extension bearing prevents shaft movement and takes thrust loads in stride.

Reliability is assured by complete pressure-proof design, plus a warning system. Corrosion-resistant cast iron end shields and frames are complemented with stainless steel hardware and shafts. Extra-long rabbet fits are protected with "O" ring seals, assuring a moisture-proof barrier against abrasive fluids. All leads are epoxy sealed. Two seals provide double protection for electrical parts. If the outer seal fails, the inner seal safeguards the motor while water enters the oil filled chamber. A moisture sensing probe detects the influx of water and warns of impending failure. The signal can be used to shut down the motor or simply to signal the need for preventative maintenance. Motors are rated thermally to NEMA MG1-12.42. Thermal protection is standard. Insulation is a special compatible Class F rated system providing 1.15 service factor and long life. Special seals or "O" rings are available for high ambient applications.

Easy Installation — Motor is supplied with twenty-five feet of multi-conductor, power cable and control cable (1), with ground wire (2) as standard. Large chamber (3) speeds cable connection. Leads are reconnectable for dual voltage. Close coupling to pump eliminates alignment problems. Impeller mounts on motor stainless steel shaft extension (4), which also serves as pump shaft. Pump and motor assembly can be lowered into position as a single, compact unit. Special universal mounting flange (5) fits most standard pumps; modifications available for one size smaller flange. Small overall motor dimensions, through use of NEMA-T frame electrics, reduce space requirements.

Long lasting internal components — Special Class F insulation system (6) rated for continuous duty in 40°C. liquids at 1.15 service factor. Thermal protection (7) standard on all motors. Conservatively rated locked antifriction bearings (8) for thrust loads.

Complete environmental protection — Buna-N grommets (9), epoxy sealed leads (10), and butt spliced connectors (11) keep liquids from entering the top of the motor. All mating frame fits (12) have rabbet joints with a large overlap, as well as O-ring seals (13). End brackets (14) and frame (15) are corrosionresistant cast iron. Smooth frame design unobstructed by ribs eliminates clogging of frame and makes cleaning easy. Hardware (16) is stainless steel. Seal rubbing faces (17) are carbon and ceramic for corrosion resistance. Inner (18) and outer seals (19) provide complete protection for motor internals. Both seals have stainless steel and Buna-N components. Sealed oil filled chamber (20) permits maximum



combined depth and internal pump pressures of 200 p.s.i. Two moisture sensing probes (21) warns of impending seal failure. The labyrinth slinger (22) provides Class I Groups C and D enclosure and acts as a protective slinger for inner seal.

SAMPLE SPECIFICATION
Submersible Sewage Pump Motors

Each submersible sewage pump shall be driven by a completely sealed electric submersible motor of _____ horsepower, 1.15 service factor, _____ RPM, for operation on _____ volts, _____ phase Hertz power. The motor nameplate horsepower rating shall not be exceeded by the brake horsepower requirements of the pump for the specified head and GPM conditions.

The submersible pump motor shall be designed for a Class 1 Groups C and D, Division I hazardous location as defined by the National Electric Code. The unit shall be listed with Underwriters Laboratories as Class 1, Groups C and D, Division I, explosion-proof, for installation in water or sewage. All electrical parts shall be housed in an air-filled cast iron, water-tight enclosure. The enclosure shall be sealed by the use of "O" rings and shall have rabbet joints with a large overlap. Cable leads shall be epoxy sealed. The motor shaft extension shall be stainless steel, impervious to the liquid and waste materials being handled. All external hardware including the motor nameplate shall also be made of stainless steel.

Tandem seals, one inside an oil chamber and one outside, shall provide double protection for the electrical parts. Two moisture sensing probes shall be used to detect any influx of conductive liquid past the outer seal and provide ample warning of first seal failure.

Bearings shall be prelubricated at the factory and designed for L-10 life of 17,500 hours. Shaft extension bearings shall be locked to prevent shaft movement and to take thrust loads.

Motor winding shall have a special Class F insulation system providing 1.15 service factor and extended life. Automatic reset, normally closed thermal overloads shall be installed in adjacent phases of the motor winding to provide the overheating protection.

Lifting eyes shall be cast into the motor housing and shall be of adequate strength to lift the entire pump motor assembly.

IN THE EVENT THE MOISTURE DETECTION SYSTEM IS NOT CONNECTED, THE RELIANCE ELECTRIC WARRANTY IS VOID.

The Duty Master Tandem Seal Submersible Motor has motor winding thermostats. The thermostats must be connected per local, state and/or the National Electric Code.

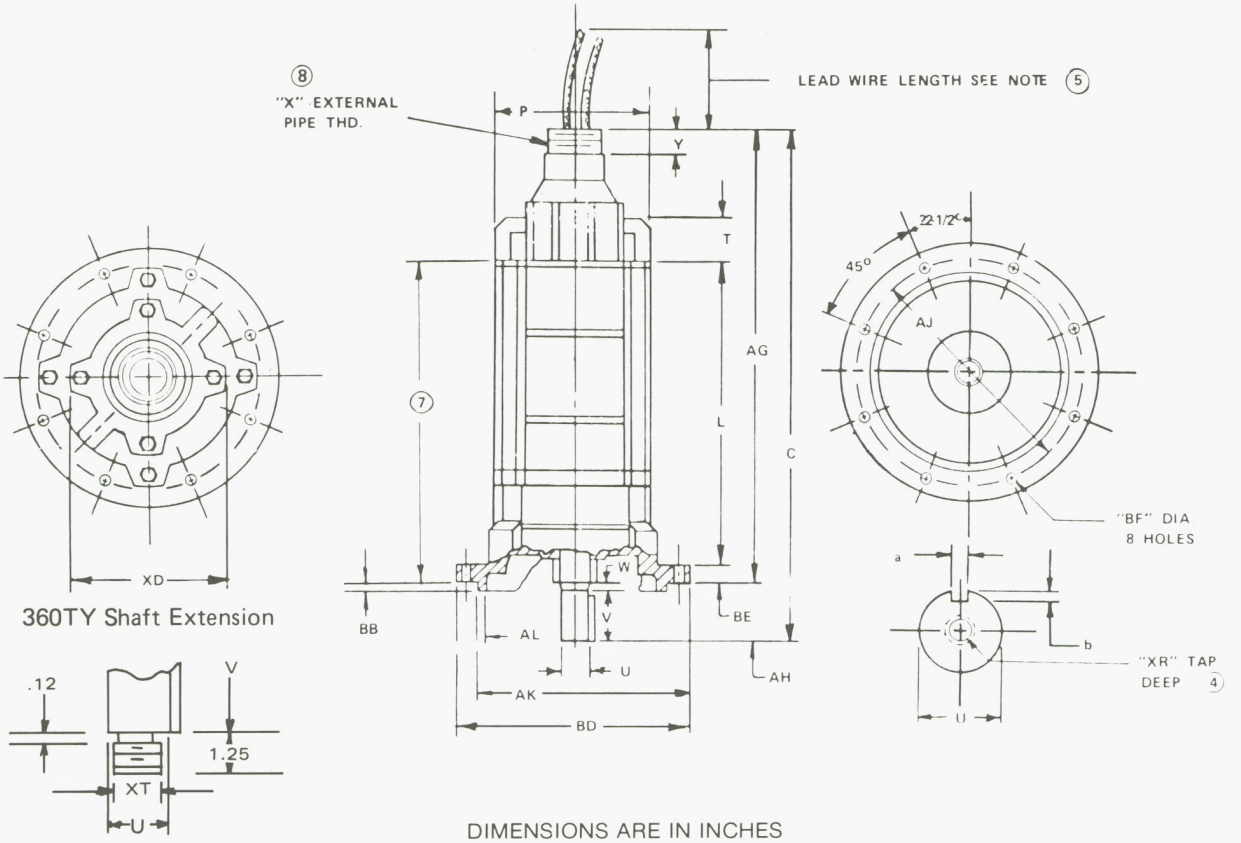
IN THE EVENT THE MOTOR WINDING THERMOSTATS ARE NOT CONNECTED, THE RELIANCE ELECTRIC WARRANTY IS VOID.

Motors destined for long term storage shall be stored in accordance to Reliance Electric suggested Service Bulletins. Any damage to the motor due to improper storage shall void the Reliance Electric warranty.

This bulletin is not intended to provide operational instructions. Appropriate Reliance Electric instruction manuals and warning tags attached to the apparatus should be read prior to installation, operation and/or maintenance of equipment.

TYPICAL DIMENSIONS

SQUIRREL-CAGE INDUCTION
ENCLOSURE: TOTALLY ENCLOSED
SUBMERSIBLE
FRAMES 140TY THRU 250TY, 320TY & 360TY



DIMENSIONS ARE IN INCHES

FRAME	C	L	P	T	U (3)	V	W	AG	AH	AJ	AK (6)	AL (2)
140TY	25.44	15.38	8.00	2.25	.8750	1.25	.31	23.88	1.56	10.00	(9)	9.125
180TY	26.66	16.50	9.62	2.25	1.2500	2.00	.28	24.38	2.28	11.50	(9)	10.625
210TY	31.69	21.12	11.50	2.25	1.4380	2.00	.25	30.12	1.56	14.12	13.125	12.00
250TY	38.53	24.12	12.75	3.50	1.750	3.31	.25	35.50	3.03	16.00	15.000	14.00
320TY	43.12	24.69	15.75	4.25	2.500	3.19	2.12	37.81	5.31	17.25	16.000	15.25
360TY	49.81	31.25	18.38	4.25	2.4997	3.19	2.12	43.25	6.56	18.75	17.500	15.25

FRAME	BD (1)	BE	BF	XR (4)	XT	LEAD CONNECTION			BB	KEYWAY		WEIGHT
						X (8)	Y	XD		a	b	
140TY	11.062	.75	.44	3/8-16	(9)	2-1/2-8	1.25	5.50	.12	.187	.09	160
180TY	12.375	.75	.56	1/2-13	(9)	1-2/2-8	1.25	6.75	.12	.250	.12	200
210TY	15.250	.75	.56	5/8-11	(9)	2-1/2-8	1.25	7.75	.25	.375	.19	315
250TY	17.000	1.00	.69	5/8-11	(9)	2-1/2-8	1.25	7.75	.25	.375	.19	750
320TY	18.750	.88	.69	3/4-16	(9)	3-8	1.25	10.88	.25	.50	.25	1150
360TY	20.25	1.12	.69	(9)	1-1/2-12	3-8	1.25	10.88	.25	.50	3.00	1500

DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

(1) "BD" varies ± .010

(2) "AL" varies + .004, −.000

(3) "U" varies up to 1.6250 dia. + .000, −.0005
1.6250 dia. and larger + .000, −.001

(4) "XR" tap depth on 140TY is .88, on 180 TY thru 250 TY is 1.38

(5) Standard lead wire length is 25 feet other lengths available if specified on sales order.

(6) "AK" varies + .000, −.002

(7) Minimum submerged depth

(8) Protective conduit furnished by customer if required.

(9) Dimension not applicable to this frame.

Reliance Electric Company / 24701 Euclid Avenue / Cleveland, Ohio 44117

RELIANCE ELECTRIC

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