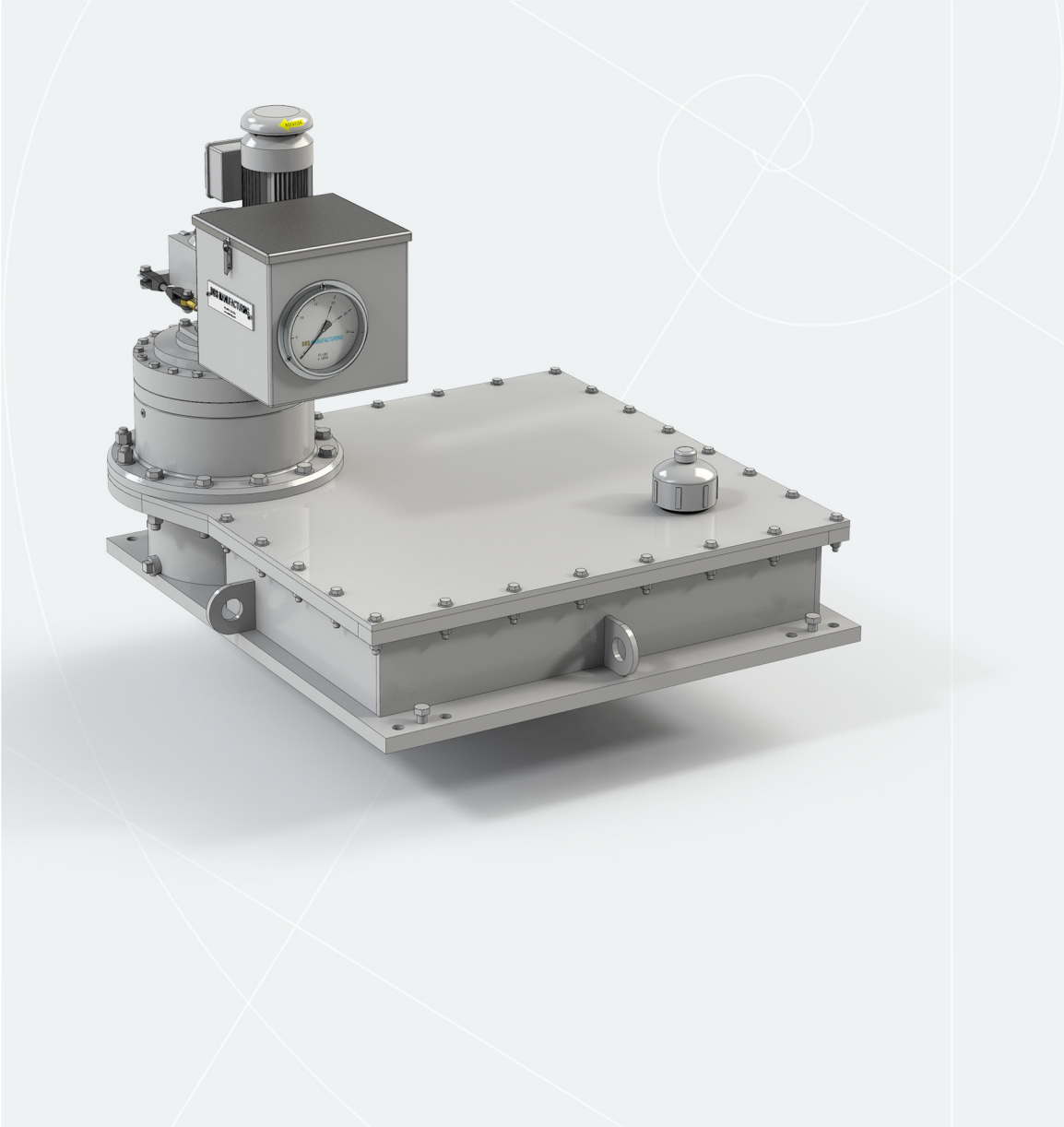
DBS MANUFACTURING

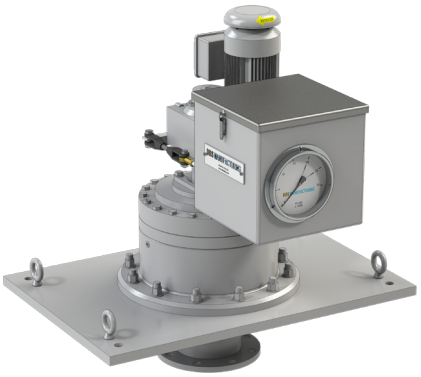
# BRIDGE-MOUNTED | DRIVE UNITS

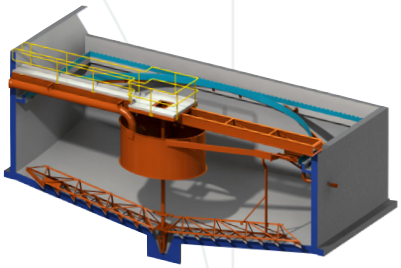


ENGINEERED FIRSTS | BUILT TO LAST

## OVERVIEW

With over 40 years of experience in designing and building drive units, DBS will provide you with the right solution for every application. The S-Series drive units are specifically designed for clarifiers and thickeners with a full span bridge and a drive shaft.





## DESCRIPTION

- A low-speed, high-torque, totally enclosed gear drive with positive overload protection
- The drive unit is supported by a bridge completely spanning the tank
- The drive unit has a central output shaft to drive the rakes
- Used in industrial, municipal and mining clarifiers and thickeners
- Typically used on tank sizes from 10 to 100 ft (3 to 30 m) in diameter

## FEATURES

- Forged alloy steel main gear and pinion designed for 20 years of life calculated per AGMA 2001-D04
- Precision, four-point-contact main bearing with a 10-year warranty
- Accurate torque gauge calibrated in ft-lbf, N-m or any units desired
- Alarm and cutoff switches and maximum torque limiting via shear pin or pressure relief valve
- No lower pinion bearing, eliminating a common source of drive failure
- Designed for minimum maintenance with permanently lubricated intermediate reducer

**TORQUE CAPACITY - BRIDGE-MOUNTED DRIVE UNITS**

| MODEL | CONTINUOUS | | MAXIMUM OVERLOAD | | YIELD | |
|---|---|---|---|---|---|---|
| | FT-LBF | N-m | FT-LBF | N-m | FT-LBF | N-m |
| SX-A* | 3,000 | 4,100 | 6,000 | 8,200 | 8,100 | 11,000 |
| SX-B* | 6,000 | 8,200 | 12,000 | 16,400 | 16,200 | 22,000 |
| SX-C* | 10,000 | 14,000 | 20,000 | 28,000 | 27,000 | 36,500 |
| S25-A* | 14,000 | 19,000 | 28,000 | 38,000 | 54,000 | 73,000 |
| S34-A* | 18,500 | 25,000 | 37,000 | 50,000 | 120,000 | 163,000 |
| S34-B* | 27,000 | 36,500 | 54,000 | 73,000 | 120,000 | 163,000 |
| S44-B* | 35,000 | 47,500 | 70,000 | 95,000 | 195,000 | 264,000 |
| S44-C* | 51,000 | 70,000 | 100,000 | 140,000 | 195,000 | 264,000 |
| S60-C* | 65,000 | 88,000 | 130,000 | 180,000 | 440,000 | 600,000 |
| S60-D* | 125,000 | 169,500 | 250,000 | 340,000 | 440,000 | 600,000 |
| S70-E* | 250,000 | 340,000 | 500,000 | 680,000 | 750,000 | 1,020,000 |
| S44-B*2 | 70,000 | 95,000 | 140,000 | 190,000 | 390,000 | 530,000 |
| S44-C*2 | 102,000 | 140,000 | 204,000 | 280,000 | 390,000 | 530,000 |
| S60-C*2 | 130,000 | 180,000 | 260,000 | 350,000 | 880,000 | 1,194,000 |
| S60-D*2 | 250,000 | 340,000 | 500,000 | 680,000 | 880,000 | 1,194,000 |
| S70-E*2 | 500,000 | 680,000 | 1,000,000 | 1,360,000 | 1,500,000 | 2,034,000 |

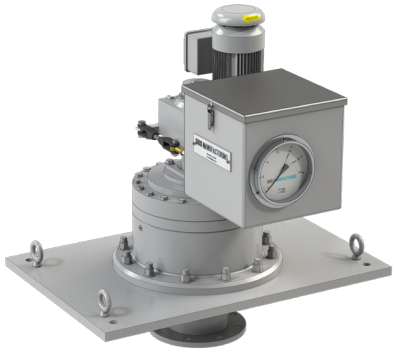
* Replace the * with the primary reducer option selected.
Continuous: Torque at which main gear will have a life in excess of 20 years at normal operating speeds.

Maximum Overload: The maximum safe, short term operating torque.
Yield: The structural maximum torque based on the minimum yield strength of the main gear.

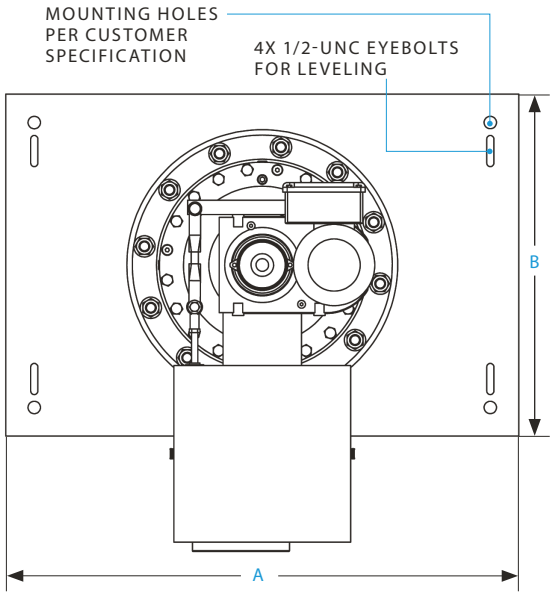
© 2018 DBS MANUFACTURING

# SX-SERIES DIMENSIONS

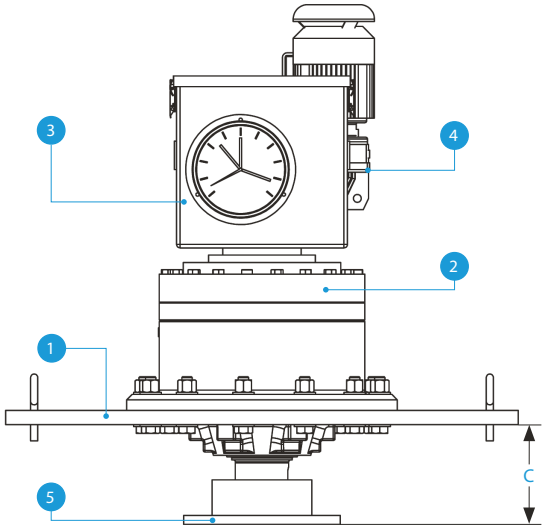
Designed for smaller tanks with a full span bridge and a drive shaft, the SX-Series drives feature a planetary gearbox with large tapered roller bearings to carry thrust and moment loads.



DRIVE UNIT PLAN




DRIVE UNIT SECTION




ITEM DESCRIPTION

1. Machine Frame
2. Planetary Gearbox
3. Torque Gauge Assembly
4. Primary Speed Reducer
5. Output Flange

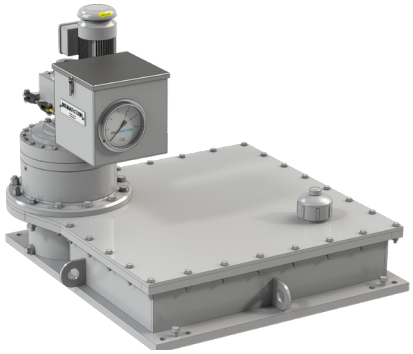
| MODEL | A | | B | | C | | OUTPUT FLANGE[1] | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|
| | IN | MM | IN | MM | IN | MM | IN | LB | KG |
| SX-A* | 36 | 914 | 24 | 610 | 5.2 | 132 | 4″ | 700 | 318 |
| SX-B* | 36 | 914 | 24 | 610 | 7 | 178 | 6″ | 900 | 410 |
| SX-C* | 36 | 914 | 24 | 610 | 8.6 | 218 | 6″ | 1,200 | 545 |

1 Metric flanges are available.
Replace the * with the primary reducer option selected.

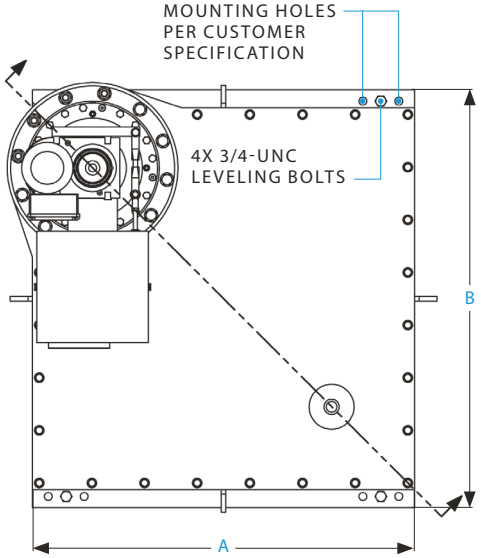
© 2018 DBS MANUFACTURING

# S-SERIES DIMENSIONS

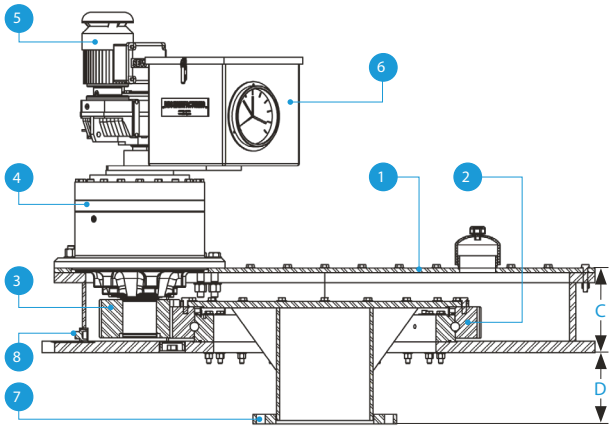
Designed for large tanks with a full span bridge and a drive shaft, the S-Series drives feature a large combination internal gear and precision ball bearing.



DRIVE UNIT PLAN




DRIVE UNIT SECTION




ITEM DESCRIPTION

1. Machine Frame
2. Main Gearbearing
3. Pinion
4. Planetary Gearbox
5. Primary Speed Reducer
6. Torque Gauge Assembly
7. Output Flange
8. Drain Plug

| MODEL | A | | B | | C | | D | | MOUNTING FLANGE[1] | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | IN | MM | IN | MM | IN | MM | IN | MM | IN | LB | KG |
| S25-A* | 32 | 813 | 36 | 914 | 7.4 | 188 | 8 | 203 | 6 | 1,340 | 610 |
| S34-A* | 39.5 | 1,003 | 43.5 | 1,105 | 8.1 | 207 | 8 | 203 | 8 | 1,940 | 880 |
| S34-B* | 42.5 | 1,080 | 46.5 | 1,180 | 9.4 | 239 | 8 | 203 | 8 | 2,340 | 1,060 |
| S44-B* | 50 | 1,270 | 55 | 1,397 | 9.3 | 236 | 10 | 254 | 10 | 2,920 | 1,330 |
| S44-C* | 54 | 1,372 | 59 | 1,499 | 11.3 | 287 | 10 | 254 | 10 | 3,500 | 1,590 |
| S60-C* | 66 | 1,676 | 70 | 1,778 | 11.5 | 292 | 12 | 305 | 18 | 5,000 | 2,270 |
| S60-D* | 68 | 1,727 | 73 | 1,854 | 10.1 | 258 | 12 | 305 | 18 | 5,600 | 2,540 |
| S70-E* | 80 | 2,032 | 80 | 2,032 | 13.5 | 343 | 0 | 0 | 24 | 20,000 | 9,090 |

1 Metric flanges are available.
Replace the * with the primary reducer option selected.

© 2018 DBS MANUFACTURING

# PRIMARY REDUCER OPTIONS

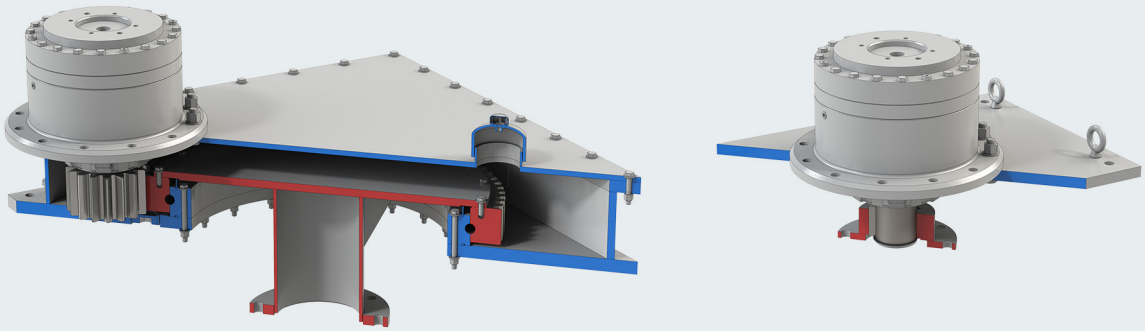
DBS drive units are made up several reducers: primary, secondary, and a final reduction unit consisting of a pinion and combination gear-bearing for larger mechanisms. All reducers are directly coupled. A selection of primary reduction units is available to meet customer requirements.

E-TYPE | L-TYPE | F-TYPE | H-TYPE | W-TYPE

**PRIMARY REDUCER OPTIONS**

ONE OF THE REDUCERS ABOVE WILL BE ASSEMBLED TO ONE OF THE DRIVE UNITS BELOW.

D-SERIES | DX-SERIES

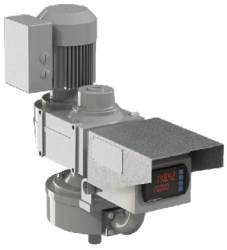


# PRIMARY SPEED REDUCER OPTIONS

Primary reduction units are available in mechanical and hydraulic versions, with unique advantages to each design. A selection is made based on customer requirements and drive unit application.

## E-TYPE

The E-type design uses helical gears for speed reduction. It has alarm and cutoff switches and a shear pin to provide triple protection of the drive unit. This design is used where the output speed is outside the limits of the F-type primary speed reducers or when an electro-mechanical type drive unit is desired.



## L-TYPE

The L-type design is similar to the E type except that the force indicator is digital and measures the force through a load cell.

## F-TYPE

The F-type design uses a hydraulic pump-motor combination for speed reduction. It has alarm and cutoff switches and hydraulic relief (equivalent to a shear pin in the E-type primary speed reducer) to provide triple protection of the drive unit. This design is positive torque-limiting and will operate under stalled and semi-stalled conditions. Optional reversing rotation and variable speed are available. The torque indication and protection system is equally accurate for operation in either direction.

## H-TYPE

The H-type design has all the features of the F-type primary speed reducer. It uses a stand-alone industrial hydraulic power unit. This design is used on higher horsepower and multiple pinion drive applications.

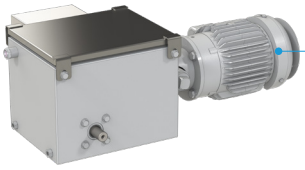
## W-TYPE

The W-type design uses helical gears for speed reduction. It has shear pin and shear pin activated cutoff switch to protect the drive unit. This is simplified E-type design used where a torque gauge and adjustable alarm switch are not required.

© 2018 DBS MANUFACTURING

# LIFT MECHANISM OPTIONS

The lift mechanism is fully contained within the drive unit and can raise and lower the rakes up to 36 inches (900 mm) by raising the lift shaft into the drive unit. In most cases, the installation of a DBS lift-equipped drive unit is no more complicated than that of a normal non-lifting clarifier drive. The lift mechanism does not rotate, so there are no rotary electrical slip rings to maintain. The lift option is offered with manual or powered operation. The powered lift mechanism provides positive lift force control to prevent damage to the rakes or the screw jack.



F-TYPE LIFT ACTUATOR

A TOTALLY ENCLOSED HYDRAULIC SPEED REDUCER POWERS THE LIFT JACK.

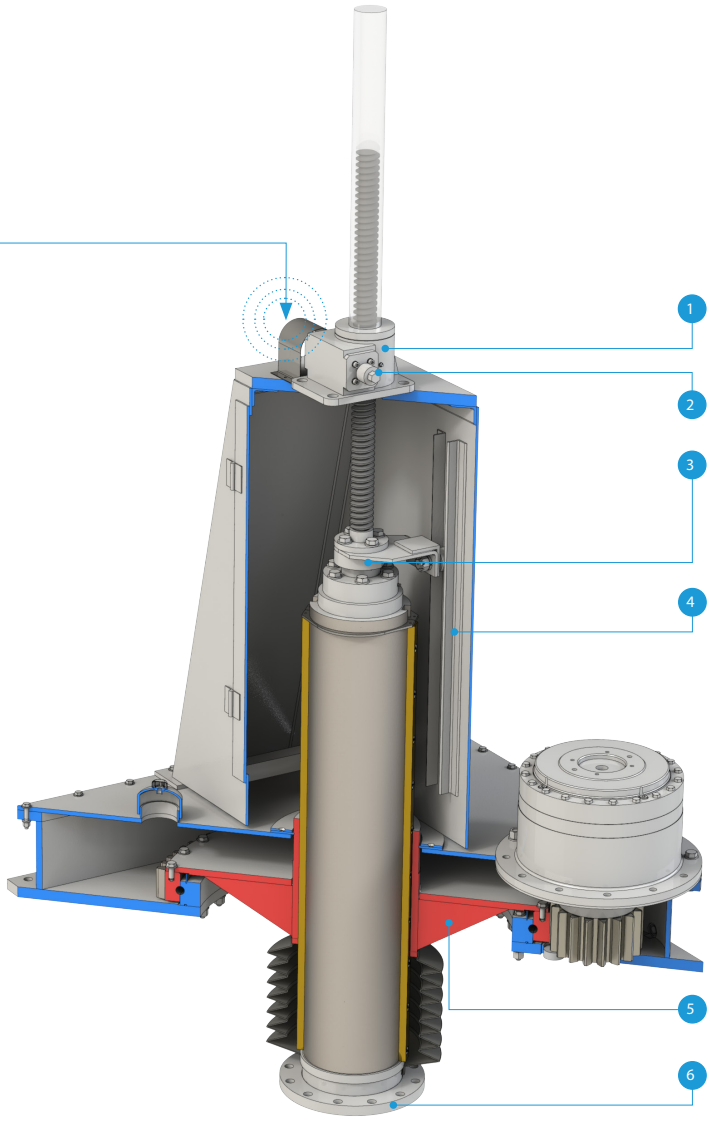
E-TYPE LIFT ACTUATOR

THE ACTUATOR UTILIZES A SERIES OF MECHANICAL SPEED REDUCERS TO POWER THE LIFT JACK.

H-TYPE LIFT ACTUATOR

A HYDRAULIC MOTOR, POWERED BY THE RAKE PRIMARY REDUCER, OPERATES THE LIFT JACK.

M-TYPE MANUAL LIFT




ITEM DESCRIPTION

1. Screw Jack
2. Emergency Hand Crank
3. Lift Bearing
4. Lift Frame
5. Lift Hub
6. Output Shaft

© 2018 DBS MANUFACTURING

# ORDERING INFORMATION

The DBS model number nomenclature is designed to easily identify size and lift option. Contact DBS or a DBS representative for assistance in deciding your equipment requirements.

| BRIDGE-MOUNTED DRIVE UNIT MODEL NUMBER | | | | | LIFT OPTION SPECIFICATION EXTENSION | | | |
|---|---|---|---|---|---|---|---|---|
| SERIES | RAKE GEAR PITCH DIA. (INCHES) | SECONDARY SPEED REDUCER | PRIMARY SPEED REDUCER | NUMBER OF PINIONS | LIFT OPTION | LIFT CAPACITY (TONS) | LIFT TRAVEL (INCHES) | LIFT ACTUATOR OPTION |
| S | X for no final gear-bearing | A | | (N/A) | L | 5 | 12<br>24 | M,E,F |
| | | B | | | | | | |
| | | C | | | (N/A) | (N/A) | (N/A) | (N/A) |
| | 25 | A | | 1 (omit)<br>2 | L | 5 | | |
| | 34 | A | E | | | 10 | | |
| | | B | F | | | 15 | 12 | M |
| | 44 | B | H | | | 15 | 24 | E |
| | | C | W | 1 (omit) | | 20 | 36 | F |
| | 60 | C | L | 2 | | 25 | | H |
| | | D | | 3 | | 35 | | |
| | 70 | | | 4 | | 50 | | |
| | | E | | | | Consult Factory | Consult Factory | Consult Factory |

EXAMPLE: MODEL S34-AF-L1012F is for a bridge-mounted drive unit; 34 is the size of the final gear pitch diameter in inches; A is the size of the secondary speed reducer; F is the type of the primary reducer; L is for a lift mechanism; 10 is the lift capacity in tons; 12 is the lift travel in inches; F is the type of the lift actuator.

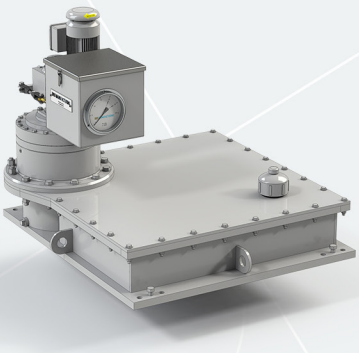
## STANDARD FEATURES

- Alarm and cutoff switches
- O&M manual in PDF format
- 6" torque gauge indicating real torque (not available on H-type primary reducer)

## OPTIONAL FEATURES

- 4-20 mA torque transducer
- Bi-directional operation (available for F and H-type primary reducers)
- Loss motion switch
- 4-20 mA lift position transducer
- Variable speed
- Explosion proof switches
- Special coating
- Oil heater (available for F and H-type primary reducers and main gear housing)
- Special electric motor
- Oil temperature switch
- Oil level switch
- Stainless steel construction

© 2018 DBS MANUFACTURING



# BRIDGE-MOUNTED DRIVE UNIT | SHAFT OUTPUT
## MODEL S34-BE

- CLARIFIER & THICKENER DRIVES
- RETROFITS
- LOW-SPEED SURFACE AERATORS
- ROTARY DISTRIBUTOR CENTER MECHANISMS

DBS MANUFACTURING

404.768.2131

engineering@dbsmfg.com
dbsmfg.com
45 SouthWoods Parkway
Atlanta, Georgia. 30354



© 2018 DBS MANUFACTURING, INC.