QUANTIS

The DODGE ILH speed reducer is suitable for c-face, separate, or integral gearmotor construction in either foot or output flange mountings, and available in single, double or triple ratios.

The DODGE RHB and MSM Speed Reducers are suitable for c-face, separate, or integral gearmotor construction in shaft-mount, foot, or output flange mountings, and available in double or triple ratios for MSM, and triple ratios for RHB.

Reducer housings are constructed of corrosion resistant, class 30 gray iron with cast internal ribbing for added strength. All housings are cast, while some covers are cast and others are steel. All housings are precision machined to assure accurate alignment for all gear sets.

ILH and MSM gearing is of single helical design and ground to provide an ellipsoid tooth form which eliminates tooth wearing and assures meshing in the strongest tooth area. RHB units also utilize spiral bevel gearing. The bevel gearing is cut and lapped. All gears are case carburized to insure a high surface durability and resilient tooth core for greater impact resistance and longer service life.

The input pinion has a shank pinion design that is assembled by being pressed into place.

Reducer bearings can be the roller or ball type and provide a minimum 10,000 hour average life. All seals are of the spring loaded type, made of nitrile rubber. Optional Viton seals are available.

Reducer gears and bearings are splash lubricated using an ISO 220 lubricant which provides protection against rust. The standard mineral oil lubricant allows an operating temperature range of 10°F to 105°F (-12°C to 41°C) ambient. Higher or lower ambient temperature conditions are addressed with optional synthetic oil.

C-face reducers are of the coupling type or clamp collar design so as to eliminate or minimize fretting corrosion between the motor shaft and the reducer stub shaft

Efficiencies are based on running at the full catalog rating. MSM and ILH units are up to 98% efficient per stage. RHB units are up to 94% efficient.

HOW TO ORDER QUANTIS

ILH, MSM and RHB Reducers and Gearmotors have catalog numbers assigned that can be found on the selection pages. Refer to the catalog number when ordering. Always specify:

- Mounting position
- Specify flange mounting, if applicable
- Accessories/Modifications, if required
- Ratio
- Output Shaft Dimension
- Input speed
- Input power

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Step 1: For applications with one start/hour or less and constant load skip Step 2 and proceed to Step 3. For application with more than one start/hour proceed to Step 2. For pulsating (cyclic) loads contact Application Engineering.

Step 2: Determine mass acceleration factor.

$$\text{Mass Acceleration Factor} = \frac{\text{all exterior moments of inertia}}{\text{moment of inertia of drive motor}} \quad [\text{lb - ft}^2]$$

Where:

Drive Motor Inertia must be provided by the motor manufacturer. On QUANTIS gearmotors, driving inertia is available from your DODGE Sales Engineer or Application Engineering.

Exterior moments of Inertia are defined as the “load inertia” referred to the motor speed. The “load inertia” must be provided by the driven machine manufacturer. For assistance contact Application Engineering or see the following formulas.

$$\text{Exterior Moment of Inertia (Rotating)} = \text{Load Inertia } X \left(\frac{\text{Load RPM}}{\text{Motor RPM}}\right)^2$$

$$\text{Exterior moment of Inertia (Linear)} = W \times \left(\frac{V}{6.28N}\right)^2$$

Where: W - Weight (lbs)
V = Linear Velocity (Ft. / Min.)
N = Motor RPM

Note: Gearbox inertia, not addressed above, are typically negligible. If required, inertia values for the QUANTIS unit may be obtained from your DODGE Sales Engineer or Application Engineering.

Step 3: With inertia ratio determined, use Chart 1 to select load classification.

Chart 1 Load Classification

Load Classification	(Driven Machine
I Light shocks	**Mass acceleration factor ≤ 0.3:** Generators, belt conveyors, platform conveyors, auxiliary machine tool drives, turbo blowers, turbo compressors, agitator and mixers for light uniform density materials
II Moderate shocks	**Mass acceleration factor ≤ 3:** Main machine tool drives slewing gear, cranes, inducted draught fans, mixer and agitator for materials with variable density, multi cylinder piston pumps, metering pumps
III Heavy shocks	**Mass acceleration factor ≤ 10:** Punch presses, shears, Banbury mixers, rolling mill and foundry drives, bucket dredger, heavy centrifugal drives, heavy metering pumps, rotary drilling equipment, briquet presses, pug mills

Step 4: Service Factor

The listed service factors in Chart 2, apply only when integral electric motors are used as prime motors and are for general industrial applications. It is recommended that the Application Worksheet on page Engineering-23 be completed and sent to Application Engineering when any of the following conditions are expected.

- Instantaneous loads exceed 200% of the reducer ratings
- Frequent or cyclical speed changes
- Heavy shock loads
- Reversing loads
- Temperature variations
- Prime movers other than electric motors
- Other questionable conditions

Daily Operation		8 Hours			16 Hours			24 Hours		
Starts/hour		< 10	10 - 200	> 200	< 10	10 - 200	> 200	< 10	10 - 200	> 200
Load Classification	I	1.0	1.1	1.2	1.1	1.2	1.3	1.3	1.4	1.5
	II	1.2	1.3	1.4	1.3	1.4	1.5	1.5	1.6	1.7
	III	1.4	1.5	1.6	1.5	1.6	1.7	1.7	1.8	2.0

Step 5: Reducer Selection

Using the service factor obtained in Step 4, calculate the equivalent HP by multiplying the motor HP to be transmitted by the service factor. The electric motor nameplate rating should be used for the motor HP.

Equivalent HP = Motor HP x Service Factor

Step 6: Reducer selection: From rating tables in this catalog make reducer selection based on input RPM, ratio, and equivalent HP.

Gearmotor selection: From rating tables in this catalog make gearmotor selection based on output RPM, motor HP, and service factor. This will indicate gearcase size, motor frame size, output torque, and output OHL capacity.

Step 7: Check Thermal Rating

Compare the thermal input horsepower rating of the reducer selected to the motor horsepower. Thermal rating should always equal or exceed applied motor horsepower.

Step 8: Check overhung loads by using the following formula:

$$OHL = \frac{126{,}000 \times HP \times F_C}{PD \times RPM}$$

Where:
- OHL = Overhung load (lbs)
- HP = Demand Horsepower
- Fc = Load Connection Factor
  - Chain Drive: Fc = 1.00
  - Spur or Helical Gear: Fc = 1.25
  - Synchronous Belt Drive: Fc = 1.30
  - V-Belt Drive: Fc = 1.50
  - Flat Belt: Fc = 2.50
- PD = Pitch Diameter (inches)
- RPM = Revolutions per Minute (output)

The calculated OHL must be less than the allowable OHL.

To minimize overhung load and increase bearing life, the load centerline should be located as close to the shaft shoulder as possible. For applications where OHL exceeds catalogued values use the reducer selection tables to select the next largest size gearcase or contact Application Engineering.

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Service Factor Classification For Industry Applications

Applications which expose the gear drive to high starting torques, extreme repetitive shock, or where high energy loads must be absorbed as when stalling, require special consideration. Service factors for the special applications should be agreed upon by the user and DODGE since variations of the values in the table may be required.

The service factors in the service factor table are based on the use of an electric or hydraulic motor or the use of a steam or gas turbine as a prime mover. If the prime mover is a single or multi-cylinder engine, then the service factor must be adjusted in accordance with Table 1.

Table 1

CHART 3 - CONVERSION TABLE FOR SINGLE OR MULTI-CYLINDER ENGINES TO FIND EQUIVALENT SINGLE OR MULIT-CYLINDER APPLICATION FACTOR OR SERVICE FACTOR		
Steam And Gas Turbines, Hydraulic Or Electric Motor	Single Cylinder Engines	Multi-Cylinder Engines
1.00	1.50	1.25
1.25	1.75	1.50
1.50	2.00	1.75
1.75	2.25	2.00
2.00	2.50	2.25
2.25	2.75	2.50
2.50	3.00	2.75
2.75	3.25	3.00
3.00	3.50	3.25
3.50	4.00	3.75

Table 2 - SERVICE FACTOR

Application	Service 3-10 Hrs. / Day	Service 10+ Hrs / Day
AGITATORS (MIXERS)		
Pure Liquids	1.00	1.25
Liquids & Solids	1.25	1.50
Liquid - Variable Density	1.25	1.50
BLOWERS		
Centrifugal	1.00	1.25
Lobe	1.25	1.50
Vane	1.25	1.50
BREWING & DISTILLING		
Bottle Machinery	1.00	1.25
Brew Kettles, Cont. Duty	1.25	1.25
Cookers - Cont. Duty	1.25	1.25
Mash Tubs - Cont. Duty	1.25	1.25
Scale Hoppers - Frequent Starts	1.25	1.50
CAN FILLING MACHINES	1.00	1.25
CAR DUMPERS	1.75	2.00
CAR PULLERS	1.25	1.50
CLARIFIERS	1.00	1.25
CLASSIFIERS	1.25	1.50
CLAY WORKING MACHINERY		
Brick Press	1.75	2.00
Briquette Machines	1.75	2.00
Pug Mills	1.25	1.50
COMPACTORS	2.00	2.00
COMPRESSORS		
Centrifugal	1.00	1.25
Lobe	1.25	1.50
Reciprocating:		
Multi-cylinder	1.50	1.75
Single Cylinder	1.75	2.00

Application	Service 3-10 Hrs. / Day	Service 10+ Hrs / Day
CONVEYORS - General Purpose Includes Apron, Assembly, Belt, Bucket, Chain, Flight, Oven and Screw		
Uniformly Loaded or Fed	1.00	1.25
Heavy Duty - Not Uniformly Fed	1.25	1.50
Severe Duty - Reciprocating or Shaker	1.75	2.00
CRANES		
Dry Dock		
Main Hoist	2.50	2.50
Auxiliary Hoist	2.50	3.00
Boom Hoist	2.50	3.00
Slewing Drive	2.50	3.00
Traction Drive	3.00	3.00
Container		
Main Hoist	3.00	3.00
Boom Hoist	2.00	2.00
Trolley Drive		
Gantry Drive	3.00	3.00
Traction Drive	2.00	2.00
Mill Duty		
Main Hoist	3.50	3.50
Auxiliary Hoist	3.50	3.50
Bridge	3.00	3.00
Trolley Travel	3.00	3.00
Industrial Duty		
Main Hoist	2.50	3.00
Auxiliary Hoist	2.50	3.00
Bridge	3.00	3.00

Application	Service 3-10 Hrs. / Day	Service 10+ Hrs / Day
Trolley Travel	3.00	3.00
CRUSHERS		
Ore or Stone	1.75	2.00
DREDGES		
Cable Reels	1.25	1.50
Conveyors	1.25	1.50
Cutter Head	2.00	2.00
Pumps	2.00	2.00
Screen Drives	1.75	2.00
Stackers	1.25	1.50
Winches	1.25	1.50
ELEVATORS		
Bucket	1.25	1.50
Centrifugal Discharge	1.00	1.25
Escalators	1.00	1.25
Freight	1.25	1.50
Gravity Discharge	1.00	1.25
EXTRUDERS		
General	1.50	1.50
Plastics		
Variable Speed Drive	1.50	1.50
Fixed Speed Drive	1.75	1.75
Rubber		
Continuous Screw Operation	1.75	1.75
Intermittent Screw Operation	1.75	1.75
FANS		
Centrifugal	1.00	1.25
Cooling Towers	2.00	2.00
Forced Draft	1.25	1.25

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QUANTIS
Service Factor (cont')

Application	Service 3-10 Hrs. / Day	Service 10+ Hrs / Day
FANS (Continued)		
Induced Draft	1.50	1.50
Industrial & Mine	1.50	1.50
FEEDERS		
Apron	1.25	1.50
Belt	1.25	1.50
Disc	1.00	1.25
Reciprocating	1.75	2.00
Screw	1.25	1.50
FOOD INDUSTRY		
Cereal Cookers	1.00	1.25
Dough Mixers	1.25	1.50
Meat Grinders	1.25	1.50
Slicers	1.25	1.50
GENERATORS AND EXCITERS	1.00	1.25
HAMMER MILLS	1.75	2.00
HOIST		
Heavy Duty	1.75	2.00
Medium Duty	1.25	1.50
Skip Hoist	1.25	1.50
LAUNDRY		
Tumblers	1.25	1.50
Washers	1.50	2.00
LUMBER INDUSTRY		
Barkers - Spindle Feed	1.25	1.50
Main Drive	1.75	1.75
Conveyors - Burner	1.25	1.50
Main or Heavy Duty	1.50	1.50
Main Log	1.75	2.00
Re-Saw Merry-Go-Round	1.25	1.50
Conveyor		
Slab	1.75	2.00
Transfer	1.25	1.50
Chains		
Floor	1.50	1.50
Green	1.50	1.75
Cut-Off Saws		
Chain	1.50	1.75
Drag	1.50	1.75
Debarking Drums	1.75	2.00
Feeds		
Edger	1.25	1.50
Gang	1.75	1.75
Trimmer	1.25	1.50
Log Deck	1.75	1.75
Log Hauls - Incline, Well Type	1.75	1.75
Log Turning Devices	1.75	1.75
Planer Feed	1.25	1.50
Planer Tilting Hoists	1.50	1.50
Rolls - Live - Off Bearing - Roll Cases	1.75	1.75

Application	Service 3-10 Hrs. / Day	Service 10+ Hrs / Day
Sorting Table, Tipple Hoist	1.25	1.50
Tipple Hoist	1.25	1.50
Transfer		
Chain	1.50	1.75
Craneway	1.50	1.75
Tray Drives	1.25	1.50
Veneer Lathe Drives	1.25	1.50
METAL MILLS		
Draw Bench Carriages & Main Drives	1.25	1.50
Runout Table		
Non-Reversing		
Group Drives	1.50	1.50
Individual Drives	2.00	2.00
Reversing	2.00	2.00
Slab Pushers	1.50	1.50
Shears	2.00	2.00
Wire Drawing	1.25	1.50
Wire Winding Machine	1.50	1.50
METAL STRIP PROCESSING MACHINERY		
Bridles	1.25	1.50
Coilers & Uncoilers	1.00	1.25
Edge Trimmers	1.25	1.50
Flatteners	1.25	1.50
Loopers (Accumulators)	1.00	1.25
Pinch Rolls	1.25	1.50
Scrap Choppers	1.25	1.50
Shears	2.00	2.00
Slitters	1.25	1.50
MILLS, ROTARY TYPE		
Ball and Rod		
Spur Ring Gear	2.00	2.00
Helical Ring Gear	1.50	1.50
Direct Connected	2.00	2.00
Cement Kilns	1.50	1.50
Dryers & Coolers	1.50	1.50
MIXERS		
Concert	1.25	1.50
PAPER MILLS		
Agitator (Mixer)	1.50	1.50
Agitator for Pure Liquids	1.25	1.25
Barking Drums	2.00	2.00
Barkers - Mechanical	2.00	2.00
Beater	1.50	1.50
Breaker Stack	1.25	1.25
Calendar (3)	1.25	1.25
Chipper	2.00	2.00
Chip Feeder	1.50	1.50
Coating rolls	1.25	1.25
Conveyors		

Application	Service 3-10 Hrs. / Day	Service 10+ Hrs / Day
Chip, Bark, Chemical	1.25	1.25
Logs (Including Slab)	2.00	2.00
Couch Rolls	1.25	1.25
Cutter	2.00	2.00
Cylinder Molds	1.25	1.25
Dryers (3)		
Paper Machine	1.25	1.25
Conveyor Type	1.25	1.25
Embosser	1.25	1.25
Extruder	1.50	1.50
Fourdrinier Rolls (Includes lump breaker, dandy roll, wire turning and return rolls	1.25	1.25
Jordan	1.50	1.50
Kiln Drive	1.50	1.50
Mt. Hope Rolls	1.25	1.25
Paper Rolls	1.25	1.25
Platter	1.50	1.50
Presses - Felt & Suction	1.25	1.25
Pulper	2.00	2.00
Pumps - Vacuum	1.50	1.50
Reel (Surface Type)	1.25	1.25
Screens -		
Chip	1.50	1.50
Rotary	1.50	1.50
Vibrating	2.00	2.00
Size Press	1.25	1.25
Super Calender	1.25	1.25
Thickener		
AC Motor	1.50	1.50
DC Motor	1.25	1.25
Washers		
AC Motor	1.50	1.50
DC Motor	1.25	1.25
Wind & Unwind Stand	1.00	1.00
Winders (Surface Type)	1.25	1.25
Yankee Dryer	1.25	1.25
PLASTIC INDUSTRY		
Primary Processing		
Intensive Internal Mixers		
Batch Mixers	1.75	1.75
Continuous Mixers	1.50	1.50
Batch Drop Mill - 2 Smooth Rolls	1.25	1.25
Continuous Feed, Holding & Blend Mill	1.25	1.25
Compounding Mill	1.25	1.25
Calenders	1.50	1.50
Secondary Processing		
Blow Molders	1.50	1.50
Coating	1.25	1.25

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QUANTIS
Service Factor (cont')

Application	Service 3-10 Hrs. / Day	Service 10+ Hrs / Day
PLASTIC INDUSTRY (Continued)		
Film	1.25	1.25
Pipe	1.25	1.25
Pre-Plasticizers	1.50	1.50
Rods	1.25	1.25
Sheet	1.25	1.25
Tubing	1.75	2.00
PULLERS - Barge Haul	1.25	1.50
PUMPS		
Centrifugal	1.00	1.25
Proportioning	1.25	1.50
Reciprocating		
Single Acting, 3 or More Cylinders	1.25	1.50
Double Acting, 2 or More Cylinders	1.25	1.50
Rotary		
Gear	1.00	1.25
Lobe	1.00	1.25
Vane	1.00	1.25
RUBBER INDUSTRY		
Intensive Internal Mixers		
Batch Mixers	1.75	1.75
Continuous Mixers	1.50	1.50
Mixing Mill - 2 smooth rolls	1.50	1.50
(If corrugated rolls are used, then use the same service factors that are used for a Cracker - Warmer)		
Batch Drop Mill - 2 Smooth Rolls	1.50	1.50
Cracker Warmer - 2 Rolls; 1 Corrugated Roll	1.75	1.75
Cracker - 2 Corrugated Rolls	2.00	2.00
Holding, Feed & Blend Mill - 2 Rolls	1.25	1.25
Refiner - 2 Rolls	1.50	1.50
Calenders	1.50	1.50
SAND MULLER	1.25	1.50
SCREENS		
Air Washing	1.00	1.25
Rotary - Sand or Gravel	1.25	1.50
Traveling Water Intake	1.00	1.25
SEWAGE DISPOSAL		
Bar Screens	1.25	1.25
Chemical Feeders	1.25	1.25
Dewatering Screens	1.50	1.50
Scum Breakers	1.50	1.50
Slow or Rapid Mixers	1.50	1.50
Sludge Collectors	1.25	1.25
Thickeners	1.50	1.50
Vacuum Filters	1.50	1.50
SUGAR INDUSTRY		
Beet Slicer	2.00	2.00
Cane Knives	1.50	1.50
Crushers	1.50	1.50
Mills (Low Speed End)	1.75	1.75
TEXTILE INDUSTRY		
Batchers	1.25	1.50
Calenders	1.25	1.50
Card	1.25	1.50
Dry Cans	1.25	1.50
Dryers	1.25	1.50
Dyeing Machinery	1.25	1.50
Looms	1.25	1.50
Mangles	1.25	1.50
Nappers	1.25	1.50
Pads	1.25	1.50
Slashers	1.25	1.50
Soapers	1.25	1.50
Spinners	1.25	1.50
Tenter Frames	1.25	1.50
Washers	1.25	1.50
Winders	1.25	1.50

LUBRICATION OPTIONS

The list below shows lubricants that are available as factory fill in QUANTIS reducers. The standard factory fill lubricant is Mobilgear 600 XP 220, which is a high performance mineral oil lubricant with special additives for use in industrial gear products.

Ambient Temperature	Oil Type	ISO Viscosity Grade	Available Oils	Available Food Grade Oils (NSF H1)
10° F to 105° F (-12° C to 41° C)	Mineral Oil	220	Mobilgear 600 XP 220 (standard fill *)	~
-20° F to 50° F (-29° C to 13° C)	Synthetic	68	Mobil SHC 626	~
-10° F to 115° F (-23° C to 46° C)	Synthetic	220	Mobil SHC 630	~
30° F to 140° F (-0° C to 60° C)	Synthetic	460	Mobil SHC 634	~
25° F to 75° F (-4° C to 29° C)	Mineral Oil	220	~	Chevron FM 220
45° F to 105° F (7° C to 41° C)	Mineral Oil	460	~	Chevron FM 460

***** Previous factory fill oil was Mobilgear 630 - Mobilgear 600 XP220 and Mobilgear 630 are completely compatible with each other and do not require a flush.

Ambient temperatures listed are for lubricants only and do not indicate a particular gear unit's suitability to run in that ambient. Contact DODGE Gearing Application Engineering for application assistance.

All reducers are factory filled according to the mounting position indicated on the order. If the mounting position is changed from the ordered mounting position, the oil level must be changed. The oil volumes shown in the mounting position charts are approximate. The correct oil level is determined by the oil level hole in the housing except for size 38 reducers. If the reducer is ordered with the standard mineral oil and the oil is later changed to synthetic oil, it is recommended the shaft seals be changed to Viton (FKM) material.

ILH, MSM, and RHB reducers are furnished with oil level, drain, and fill plugs except for the size 38, which only has a fill plug. Before starting operation, the breather must be located in the correct location.

Continued operation in cold ambient conditions requires special modifications. Please contact DODGE Gearing Application Engineering for application assistance.

The density of the standard factory fill oil is 0.93 lbs/pint (1.98 lbs/liter).

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Maximum Allowable Weight of Motors on QUANTIS C-Face Reducers

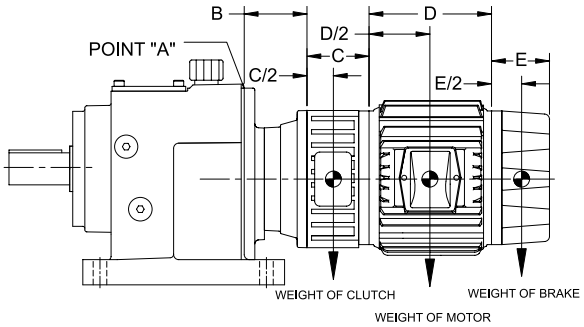
When using QUANTIS reducers with C-face inputs, the load from the weight of the motor, plus any brakes, clutches, or other hardware, must be compared to the maximum allowable load. Failure to check the load may result in product failure and injury. The table below lists the maximum allowable load for applications without external shock loading. The information below the table shows how to calculate the actual load. If unsure on how to perform this check, please contact DODGE Gearing Application support. If the calculated load exceeds the maximum allowable load, it is recommended that a separate-input style reducer and foot mounted motor be used. If a c-face input style must be used, then the motor must be supported independently from the reducer. The motor feet must be shimmed by qualified personnel to avoid putting forces on the reducer.

Unit Size		Maximum
ILH or MSM	RHB	Allowable Load
38	38 - 48	1900
48	68	1950
68	88	3300
88	108	6300
108	128	9400
128	148	16600
148	168	25000
168	-	26000

The actual load is calculated by multiplying the distance from the c-face mounting flange on the reducer, Point “A”, to the center of weight of each device, then adding all of the values together. All distances need to be in inches and the weights need to be in pounds.

B = Length of the input assembly. This equals the **ZC** value which is shown on the dimensions pages for each reducer and input size combination.

C = Width of the clutch. (If a clutch is not used, ignore this item) C/2 (C divided by 2) is the distance from the clutch mounting flange to the center of weight for the clutch



D = Width of the main body of the motor. This information can be obtained from the motor manufacturer – it is typically the “C” dimension minus the length of the input shaft. D/2 (D divided by 2) is the distance from the motor mounting flange to the center of weight for the motor. If a clutch is located between the motor and reducer, the length of the clutch, “C”, must be added to D/2 when calculating the load.

E = Width of the brake (if a brake is not used, ignore this item). The center of weight for the brake can be determined by dividing the total width of the brake by 2 (E/2). The width of the clutch, “C”, and the width of the motor, “D”, must be added to E/2 when calculating the load.

EXAMPLE OF AN APPLICATION WITH A CLUTCH, MOTOR AND BRAKE, MOUNTED ON A SIZE 48 RHB FOOTED REDUCER WITH SOLID OUTPUT SHAFT WITH A 140TC CLAMP COLLAR INPUT:

FOR THIS EXAMPLE:

Width of the clutch, “C” is 3.6”

Clutch weight is 13.3 Lbs.

Width of the main body of the motor, “D”, is 11.4”

Motor weight is 44 Lbs.

Width of the brake, “E”, is 4.0”

Brake weight is 18.5 Lbs.

Maximum Allowable Weight of Motors on QUANTIS C-Face Reducers (continued)

B = ZC from Page RHB-123 = **4.17"**

C/2 = Clutch width ÷ 2 = 3.6 ÷ 2 = **1.8"**

D/2 = Motor main body width ÷ 2 = 11.4 ÷ 2 = **5.7"**

E/2 = Brake width ÷ 2 = 4.0 ÷ 2 = **2.0"**

CALCULATION OF THE LOADS FROM EACH COMPONENT – for each calculation, the distance from the center of weight from each component to Point "A" is multiplied by the weight of the component.

The load from the weight of the clutch = ("B" + "C/2") x clutch weight

= (4.17 + 1.8) x 13.3 = **79 in-lbs**

The load from the weight of the motor = ("B" + "C" + "D/2") x motor weight

= (4.17 + 3.6 + 5.7) x 44 = **593 in-lbs**

The load from the weight of the brake = ("B" + "C" + "D" + "E/2") x brake weight

= (4.17 + 3.6 + 11.4 + 2.0) x 18.5 = **392 in-lbs**

The total load is the sum of the component loads and equals **79 + 593 + 392 = 1,064 in-lbs**. The allowable load for a size 48, RHB = 1,900, so this combination of components is acceptable for an application without external shock loading.

If this example did not have a clutch or brake, then the load from the motor would be calculated as:

The load from the weight of the motor = ("B" + "D/2") x motor weight

= (4.17 + 5.7) x 44 = **434 in-lbs**

SPECIFICATION
HOW TO ORDER

DODGE®

QUANTIS
Backstops

Backstops are available as an option, with 3-piece Coupled or Separate Input assemblies, for applications that require the prevention of reverse rotation. Backstops are internally mounted in the input assembly by the factory and cannot be reversed in the field. The backstops are premium, lift-off style, and require a minimum input shaft speed to operate correctly. After the lift-off speed is exceeded, the backstops do not have any rubbing components and do not generate any heat. Backstops should not be used for applications when the input shaft speed is below the lift-off speed.

When ordering a reducer equipped with a backstop, it is necessary to indicate on the order the desired direction of rotation of the output shaft. The backstop cannot be reversed in the field after it is assembled into the reducer. **The direction of rotation is defined by looking at the end of the output shaft**. On RHB style reducers, it is also necessary to indicate from which side of the reducer, "A" side or "B" side, the shaft is being viewed. ("A" and "B" side is shown on the following page and on the Mounting Position pages). This also applies to straight hollow shaft, Twin Tapered Bushing, and shrink disk configurations except as noted.

To calculate the maximum allowable torque (peak torque) the backstop will hold at the output shaft, multiply the overall ratio of the reducer by the maximum allowable torque listed below. The nominal torque rating of the backstop is half of the peak value. **NOTE: Other internal components may limit the amount of torque the reducer can apply. Always limit the nominal torque load to the smaller of the reducer torque rating (listed in the selection pages) or nominal torque rating of the backstop.**

3-Piece Coupled	Separate Group	Lift-Off Speed (RPM)	Max. Allowable Torque (ft-lb)
56C	71	890	53
---	80	820	221
140TC	90	820	221
180TC	100	750	279
---	112	750	236
210TC	132	670	590
250TC	160	670	590
280TC	180	610	959
320TC	225	610	959
360TC	250	610	959

QUANTIS
Backstops (continued)

PRODUCT	UNIT SIZE	NUMBER OF REDUCTION STAGES	OUTPUT SHAFT DIRECTION OF ROTATION LOOKING AT THE EXPOSED END OF THE OUTPUT SHAFT	OUTPUT SHAFT LOCATION SIDE & VIEW	INPUT SHAFT ROTATION LOOKING AT THE EXPOSED END OF THE INPUT SHAFT
ILH	38 - 88	SINGLE	CW	-	CW
ILH	38 - 88	SINGLE	CCW	-	CCW
ILH	38 - 168	DOUBLE	CW	-	CCW
ILH	38 - 168	DOUBLE	CCW	-	CW
ILH	38 - 168	TRIPLE	CW	-	CW
ILH	38 - 168	TRIPLE	CCW	-	CCW
MSM	38 - 168	DOUBLE	CW	A	CCW
MSM	38 - 168	DOUBLE	CCW	A	CW
MSM	38 - 168	TRIPLE	CW	A	CW
MSM	38 - 168	TRIPLE	CCW	A	CCW
RHB	38 - 88	TRIPLE	CW	A	CW
RHB	38 - 88	TRIPLE	CCW	A	CCW
RHB	38 - 88	TRIPLE	CW	B ✦	CW
RHB	38 - 88	TRIPLE	CCW	B ✦	CCW
RHB	108 - 168	TRIPLE	CW	A	CCW
RHB	108 - 168	TRIPLE	CCW	A	CW
RHB	108 - 168	TRIPLE	CW	B	CW
RHB	108 - 168	TRIPLE	CCW	B	CCW

✦ Does not apply to Hollow, Twin Tapered Bushing, or Double Extended shafts. For these configurations, specify the direction of rotation by looking at the A side

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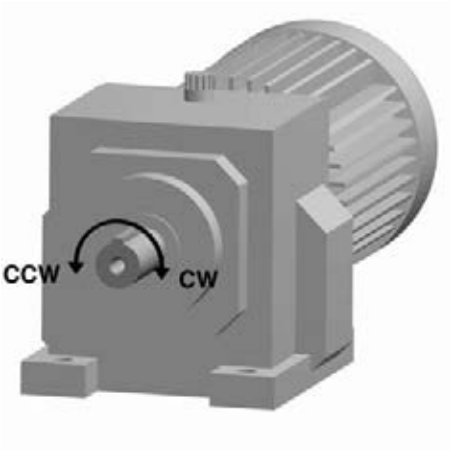
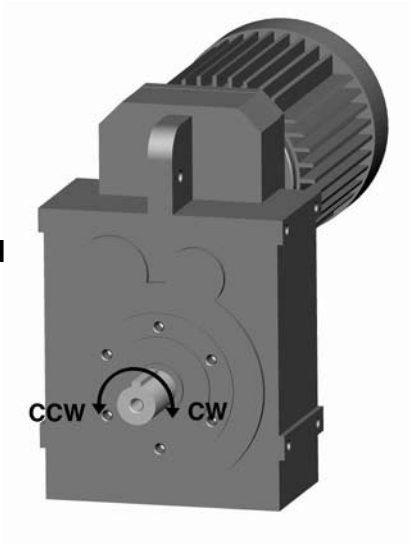
QUANTIS
Backstops (continued)

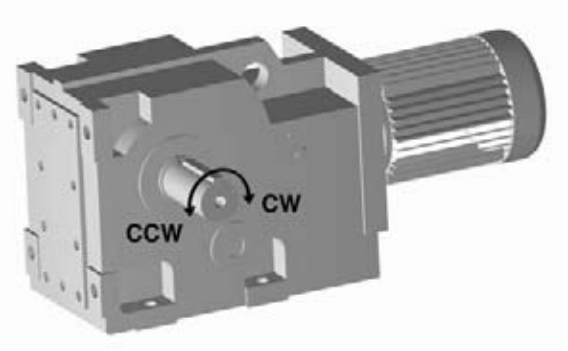


ILH

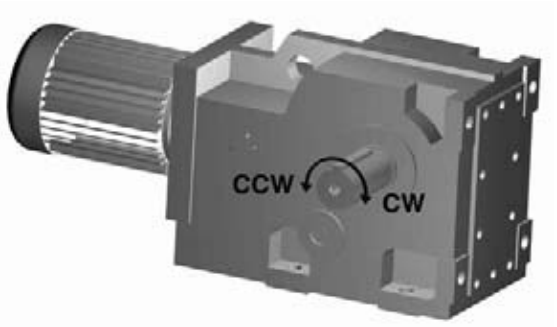
MSM



RHB - A-SIDE



RHB - B-SIDE



WARNING

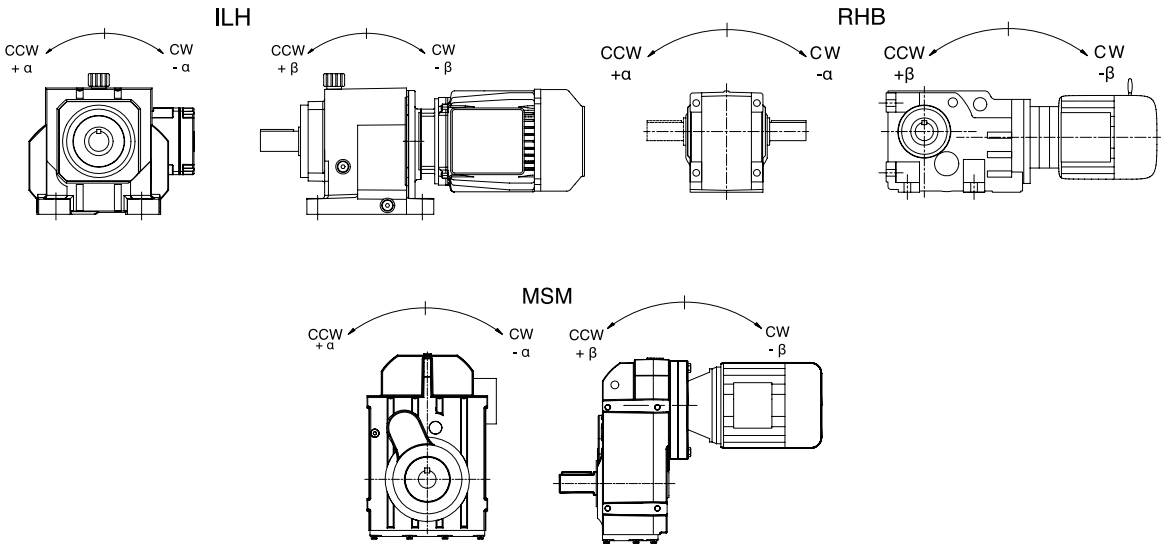
Backstops are not to be used for applications involving energy absorption and shock or torque loads in excess of reducer ratings or on applications such as chair lifts, amusement rides, etc. and where the safety of persons or property is dependent on the function. On such applications, other holding devices must be provided.

QUANTIS
Incline Mountings

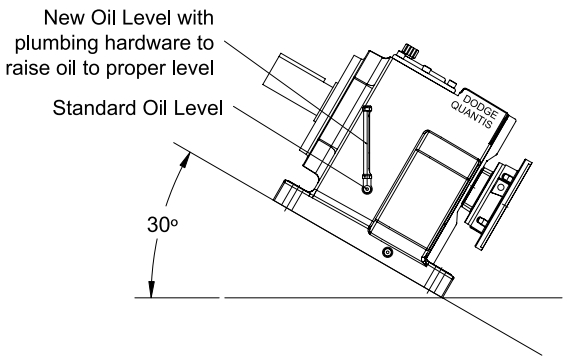
DODGE QUANTIS reducers can be modified to permit mounting in positions other than the standard mounting positions shown in the mounting position charts including inclined and tilted positions. Consult application engineering to determine what modifications are required for your specific application.

In order for DODGE to make recommendations on the required modifications, the following information must be provided:

- Reducer Size
- Ratio
- Input and/or Output speed
- Transmitted Horsepower
- Duty Cycle - Continuous vs. intermittent operation. If intermittent, running time vs. idle time.
- Mounting position, such as A1, A2. . . A6 with shafts level, a complete description of the mounting arrangement including the angle of tilt of the housing, the incline of the shafts and whether the output shaft is higher or lower than the input shaft.



For the example shown here - the unit would be called out with a CW rotation from a A1 mounting position of 30 degrees (Angle β). This illustration represents a typical arrangement for a tilted reducer. The proper oil level will vary with reducer size, ratio, input speed and angle of tilt. Consult DODGE for proper oil level.



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