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Motovario SmartBox™ was designed to be the most competitive high-efficiency gear reducer series in today's market. The key development factor of Motovario SmartBox™ is the Modularity Concept: modular production, modular assembly, modular gear reducers.

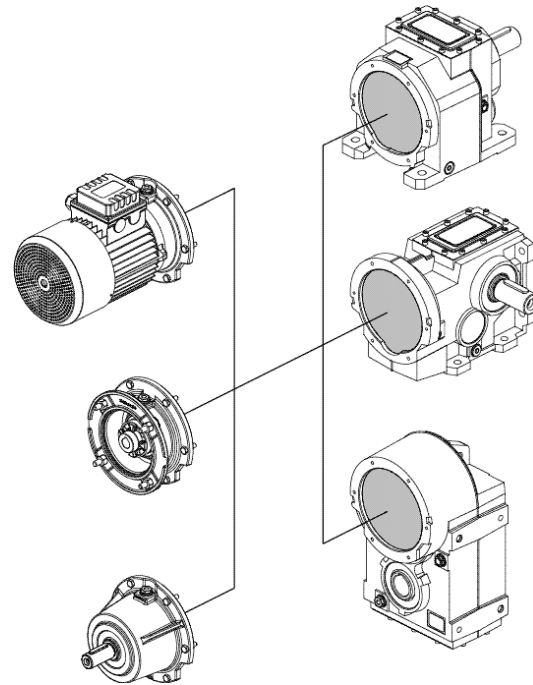
SmartBox™ is built with standardized parts, sharing gears, shafts, input sets and output flanges to simplify the production process and improve delivery. The interchangeable parts make SmartBox™ gear reducers the most flexible reducer series available. SmartBox™ reducers can be easily adapted for any application. Motovario has developed a new, flexible, high-performance gear reducer series while improving production and performance quality.

SmartBox™ introduces key design changes that reflect Motovario's commitment to innovation:

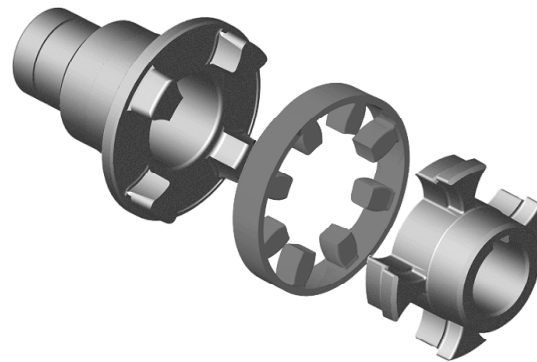
The new flexible motor coupling design integrates the motor shaft and the reducer input quill to maximize start and stop shock load capacity. The Hytel coupling eliminates fretting corrosion between the motor shaft and the input quill, making disassembly simple. The coupling design also increases the input oil seal's life by lowering temperature and reducing vibration at the input shaft. The compact coupling easily adapts for NEMA, IEC and servo motor applications.

The SmartParts™ system is designed to standardize parts throughout the SmartBox™ series, lowering cost, shortening lead times and increasing application flexibility. High-speed helical gears are a common part in the SmartBox™ line, used in all three series (H,B and S). Low-speed helical gears are a shared part between the H and B series, while output shafts are common between the B and S series. All three series also share an interchangeable input set, including the input flanges, allowing parts to be preassembled for faster production and better quality.

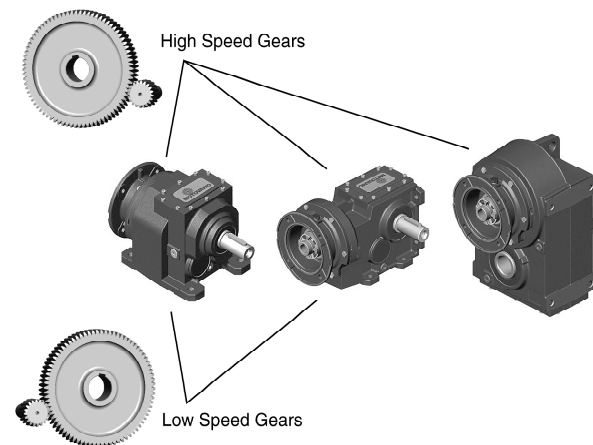
All SmartBox™ reducers feature the PowerCase™ one-piece castings of the main housing that enable the reducer to transmit more torque. The PowerCase™ also allows for more distance between support bearings, distributing loads more evenly and increasing overhung load ratings. The design of the PowerCase™ provides for a large inspection cover to help improve quality and simplify assembly and production. PowerCase™ uses the interchangeable input sets of the SmartParts™ system, so each reducer's power section can be tailored



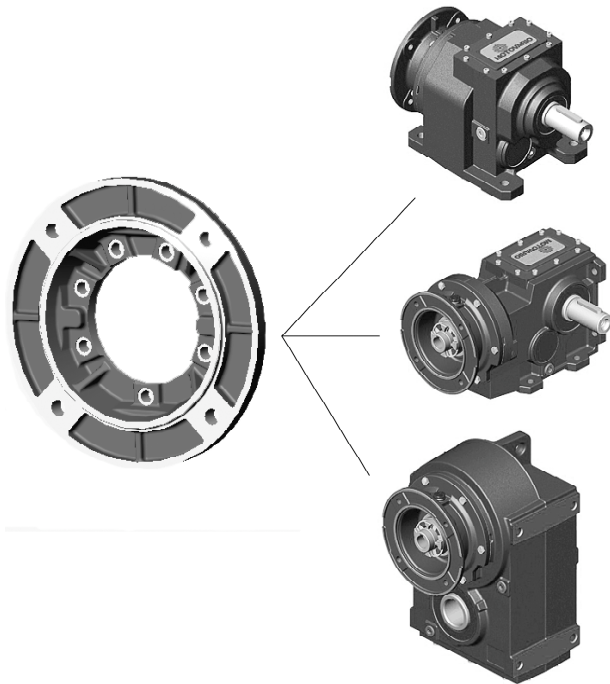
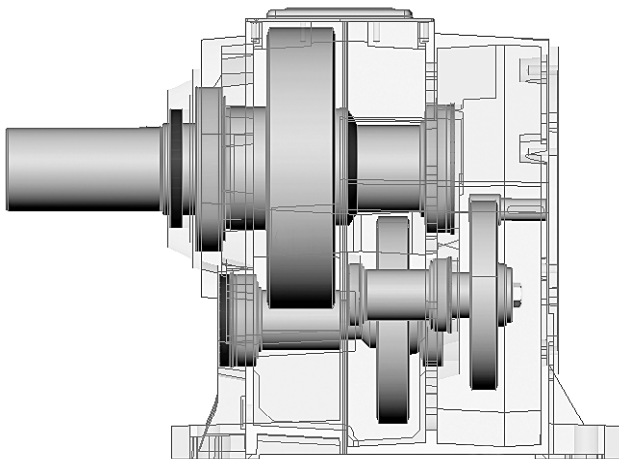
SmartBox™ Modularity



Flexible Motor Coupling



SmartParts™ Gear Sharing

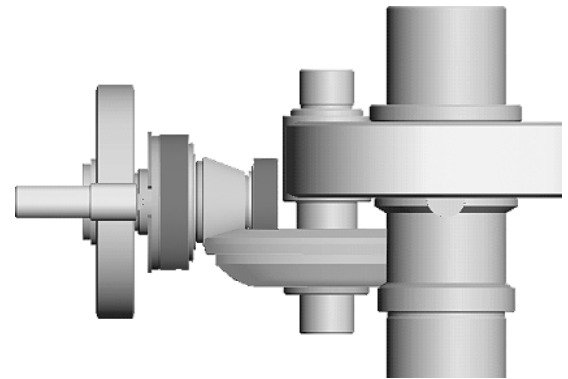
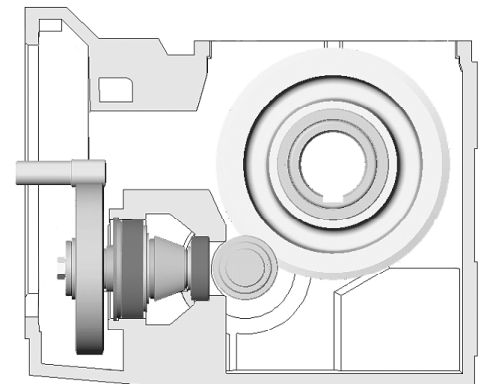

SmartParts™ Input Flange

SmartBox™ H Series Power Case

for maximum torque.

The design of the B series is focused on the weakest element of the reducer: the bevel gear. The load capacity of the reducer depends on the correct fitting and stability of the bevel gear and pinion. The SmartBox™ design solution is a bevel pinion supported between two bearings for more precise gear mesh and the elimination of gear deflection. The double-bearing design improves torque output and reducer shock-load capacity by removing the weakest link.

Basic SmartBox™ Features

- Designed for continuous duty and use in harsh or stressful applications
- Gears and hollow output bores are carburized to a hardness of 58-60 RC
- Load capacity calculated according to ISO 6336 and verified according to AGMA 2001-B88
- High-strength housings and input and output flanges of gray cast-iron G200
- Single stage reducers with efficiencies up to 98% (in-line helical H Series only)
- Double and triple stage reducers with efficiencies up to 95%
- Foot mount, flange mount, shaft mount, foot/flange mount and other configurations available


SmartBox™ B Series bevel pinion support

SmartBox™ B Series bevel pinion support (top view)

Catalog Notes

Power, Torque and Speed

Ratings and standard operating conditions are in reference to the reducer mounted in the standard horizontal position, B3 or similar, with the lubricant supplied by Motovario.

Output torque ratings are rounded to the nearest integer. Ratios are rounded to the nearest hundredth (0.00). More precise figures are available through Motovario.

Output speeds are rounded to the nearest integer. Speeds may vary slightly due to motor fluctuations or the application load applied. Ratings are in relation to the reducer's input speed.

Dimensions

SmartBox™ dimensions listed in this catalog are for standard reducers. Special applications and designs may change basic dimensions. Accessories and options are often listed as separate dimensions. Please refer to the specific accessories for dimensions.

Output flanges are separate accessories and are referred to in Motovario nomenclature with the extension "F" or "FA." Reducers may have more than one output flange option. In that case, the extension identifies an additional option (FB, FC, etc.). Dimensions of motors not supplied by Motovario may vary slightly. Please refer to the motor manufacturer for accurate dimensions and mounting configuration. Servo motors may require modified mounting configurations.

Certified dimensions and 1:1 scale drawings in electronic formats are available through Motovario.

Optional Design Features

Backstop devices on motors

Servo motor adapters

Special paint or coatings for added protection

Scoop motor mounts

Special design output bores and shafts

Please contact Motovario for your special design needs

Surface Treatment

Motovario products are supplied with the following surface treatments:

Grey cast-iron reducer housings

- De-burring by mechanical shearing system
- Accurate shot-peening
- Painting
- Washing and passivation
- Die-cast materials are always painted.

Paint used on Motovario reducers meets the following specifications:

- Orange-peel blue-colored epoxy-polyester RAL 5010
- Polyester resin based heat-hardening powders, altered with epoxy resins, applied by electrostatic spray
- Heat resistance: 24 hours at 150°C (302°F)
- Corrosion strength: ASTM B 117/97 salt fog from 100 to 500 hours, depending on the surface's preliminary treatment
- Non-toxic and non-irritating according to EEC directives no. 67/548 (dangerous substances) and no. 88/379 (dangerous compounds)

• Tests carried out on degreased Unichim white lattens (film thickness: 60 microns) comply with the following specifications:

- Adherence (ISO2409)
- Erichsen drawing (ISO152)
- Inverted shock (DIN53158)
- Cone-shaped mandrel (DIN53151)
- Hardness (ASTM D3363/74)

Special Applications

Motovario SmartBox™ reducers can be easily adapted for special environments. The reducer housings are rugged enough for most difficult applications without special preparation.

Heavy Duty Reducers:

- No special preparation necessary for reducers.

Motors:

- IP65 Enclosure Protection
- Added winding protection coat against moisture and humidity
- Added winding insulation
- Drain holes for moisture and condensation drainage
- Corrosion resistant hardware (standard)
- Blue RAL 5010 polyester-epoxy paint coating
- Metal terminal box cover

Washdown and Food Application Reducers:

- Painted with white epoxy paint or stainless-steel type paint
- Food-grade lubricant available
- Spring-loaded valve breather plugs
- Stainless-steel hollow output bore and output shafts
- BISSC® approval of gear reducer models



Washdown Motors:

- IP65 Enclosure Protection
- Painted with white epoxy paint or stainless-steel type paint
- Metal terminal box cover

Harsh Environment Reducers:

- Low- or high-temperature lubricant
- Viton® high-temperature resistant seals
- Extreme low-temperature seals

Harsh Environment Motors:

- IP65 Enclosure Protection
- Added winding protection coat against moisture and humidity
- Added winding insulation
- Drain holes for moisture and condensation drainage
- Winding heaters for extremely low temperature applications
- Forced ventilation blower for high temperature or inverter drive applications
- Corrosion resistant hardware (standard)
- Blue RAL 5010 polyester-epoxy paint coating
- Metal terminal box cover

Descriptions

H Series

Cast Iron Housings
NEMA or IEC input coupling
Inch or metric dimension input and output

CH	In-line helical gearmotor
PH	In-line helical gear reducer with input coupling
IH	In-line helical gear reducer with input shaft
Fx	Output flange for in-line helical reducer
M	Mono version, output offset down
Hxx1	In-line helical reducer, single stage
Hxx2	In-line helical reducer, double stage
Hxx3	In-line helical reducer, triple stage
Options	Heavy Duty Washdown Specific Harsh Environments

B Series

Cast Iron Housings
NEMA or IEC input coupling
Inch or metric dimension input and output
Triple stage reduction

CB	Helical bevel gearmotor
PH	Helical bevel gear reducer with input coupling
IH	Helical bevel gear reducer with input shaft
U	Universal mounting capability; surfaces for foot or flange mounting
C	Hollow output bore for shaft mount
Fx	Output flange for helical bevel reducer
S, D	Single extension output shaft for helical bevel reducer, left or right extension
P	Double extension output shaft for helical bevel reducer
L, M	Shrink disk mounting for helical bevel reducer, left or right mounting
Options	Heavy Duty Washdown Specific Harsh Environments Torque arm Shaft-lock system for shaft mount applications

S Series

Cast Iron Housings
NEMA or IEC input coupling
Inch or metric dimension input and output

CS	Parallel shaft mount gearmotor
PS	Parallel shaft mount gear reducer with input coupling
IH	Parallel shaft mount gear reducer with input shaft
C	Hollow output bore for shaft mount
Fx	Output flange for parallel shaft mount reducer
D	Single extension output shaft for parallel shaft mount reducer
L	Shrink disk mounting for parallel shaft mount reducer
Options	Heavy Duty Washdown Specific Harsh Environments Torque arm Shaft-lock system for shaft mount applications

AC Motors

IEC frame, squirrel-cage motors
Finned, aluminum housings through IEC 132 frame
IP55
Class F insulation
TEFC
50Hz or 60Hz frequency
230/460V

T	Three phase AC motor
TB	Three phase AC brakemotor
63 – 132	Frame size of Motovario Aluminum housing AC Motors, 1/6HP to 10HP
160 – 225	Frame size of high power AC motors, 15HP to 60HP
B11	Integral motor for gearmotors
B14	Face-mounted output
B5	Flange mounted output
Options	Two, four, six or eight poles TENV Heavy Duty Washdown Specific Harsh Environments

