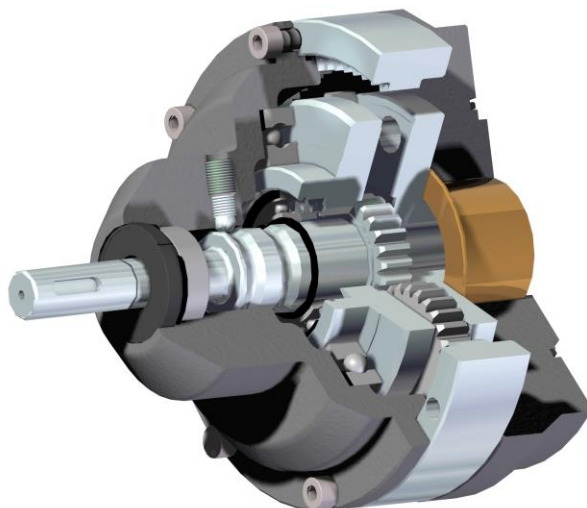


DSIR

Dual Speed Input Reducer for Manual Gearboxes



Installation, Operating and Maintenance Instructions

!!WARNING!!

! This manual contains important safety information. Please ensure it is thoroughly read and understood before installing the gearbox.

! This manual is produced to enable a competent person to install the gearbox. Only persons competent by virtue of their training or experience should install, maintain and repair the supplied gearbox.

! The gearbox weight is recorded on the dispatch note and the gearbox brochure; the gearbox may present an unbalanced load.

! With respect to handwheel operation of Rotork gearboxes, under no circumstances should any additional lever device such as a wheel-key or wrench be applied to the handwheel in order to develop more force when closing or opening the valve as this may cause damage to the valve and/or gearbox or may cause the valve to become stuck in the seated/back-seated position.

! Damage to protective coatings may invalidate warranty and should be correctly rectified.

1. Health and Safety

- 1.1 This manual is produced to enable a competent user to install, operate, adjust and inspect Rotork gearboxes. Only persons competent by virtue of their training or experience should install, maintain and repair Rotork gearboxes.
- 1.2 Work undertaken must be carried out in accordance with the instructions in this and any other relevant manuals. The user and those persons working on this equipment should be familiar with their responsibilities under any statutory provisions relating to the Health and Safety of their workplace. Due consideration of additional hazards should be taken when using the gearbox with other equipment. Should further information and guidance relating to the safe use of the Rotork products be required, it will be provided on request.
- 1.3 The mechanical installation should be carried out as outlined in this manual and also in accordance with relevant standards such as British Standard Codes of Practice. No inspection or repair should be undertaken unless it conforms to the specific hazardous area certification requirements.

!! WARNING!!

! Enclosure Materials: The gearbox enclosure may include cast iron or ductile iron.

! Operation: The gearbox must only be used as intended. Equipment not used in the manner described may lead to excessive risk and the possibility of serious injury or death.

2. Specifications and Intended Use

2.1 Intended use of the equipment: The DSIR is intended to be used in conjunction with a valve actuation gearbox to control the position of a quarter/multi turn valve for all conventional fluid. The gearbox controls the position of the obturator by turning the handwheel through multiple revolutions. The equipment is intended to be used only within the torque ranges specified. The DSIR can be used with any manual gearbox or valve with an input flange of F14 or FA14. It is used to reduce the number of input turns required and therefore the operating time for manually operated valves.

2.2 Environmental specifications:

Temp: -40°C to +120°C (-40°F to 248°F)
Sealing: IP67

2.3 Operational specifications:

Duty: Manual operation, isolating service. (Maximum 120 cycles/ min)
Max operating rim effort: 356N (80 lbs)
Max overload rim effort: 534N (120 lbs)
Overload capability: 1.5x rated torque
Max input speed: 14rpm

2.4 Functional specifications:

Input: 180 Nm (1593 lbf-ft)
Ratio: 1:1 & 4.25:1
MA for Higher ratio: 4 ±4%
Output: 720Nm (6373 lbf-in)
Max bore: 30mm
Max stem height: 60mm
Weight: 25kg

3. Storage, Unpacking and Handling

- 3.1 If your gearbox cannot be installed immediately store it in a clean dry place until you are ready to install in situ. Recommended storage temperature range: 0°C to 40°C (32°F – 104°F).
- 3.2 Gearboxes are packed in a variety of configurations depending on size, type and quantity of the consignment. It is the responsibility of the individual unpacking and handling the combination to carry out a risk assessment for the supplied arrangement to ensure safe working. Packaging material used may include wood, cardboard, polyethylene and steel. Packaging should be recycled according to local regulations.

!! WARNING!!

! Individual weights for gearboxes are recorded on their respective nameplates; gearboxes may present an unbalanced load.

! Only trained and experienced personnel should carry out handling. At all times, safe handling must be ensured!!

! Each model must be assessed to identify all risks associated with handling.

! The gearboxes must be fully supported until full valve shaft/stem engagement is achieved and the gearbox is secured to the valve flange.

! Once connected to the valve, each assembly must be assessed on an individual basis for safe handling/lifting. Never lift the complete combination-valve assembly via the gearbox!!

4. Installation

!! WARNING!!

! Ensure the valve is fully supported and capable of accepting increased weight and change of centre of gravity resulting from the addition of the gearbox.

- 4.1 The gearbox is mounted to the valve or gearbox using either standard ISO5211 or MSS SP-01 flange connections.
- 4.2 Sparingly grease the valve stem then align the gearbox base square and parallel to valve flange. It is recommended that flanges be sealed on assembly with silicon sealant. Engage gearbox on to valve shaft or gearbox input shaft
- 4.3 The gearbox is supplied with the appropriate valve stem or gearbox input shaft interface. Where a mechanical component is incorporated into the valve drive shaft (i.e. key), it is the sole responsibility of the installer to ensure the appropriate component is fitted.
- 4.4 It is essential that the gearbox baseplate is flush with the flange joint face before the mounting screws are tightened. Mounting screws or studs/nuts must be high tensile steel (grade 8.8 or higher). Firmly tighten down the fixings onto the valve flange to the torque required. (See below).

Imperial Fastener Size	Torque ±5%		Metric Fastener Size	Torque ±5%	
	Nm	lbs/ft		Nm	lbs/ft
5/8"	166	122	M16	177	131

- 4.5 If the gearbox has been supplied without the handwheel fitted, then the handwheel can be secured to the input shaft by means of the pin provided.
- 4.6 After the gearbox has been fitted to the valve or gearbox flange, the gearbox should be operated to ensure satisfactory operation.

5. Operation

- 5.1 Normal operation of the valve will be seen with a rim effort below 80lbs (356N). Clockwise rotation of the handwheel results in clockwise (as viewed from above the gearbox) rotation of the valve stem. The DSIR has two ratios: 1:1 and 4.25:1. Switching between the two ratios is done by simply pushing or pulling on the input shaft. The high 4.25:1 ratio gearing is used for the portion of the valve stroke where the torque requirement is high to initially open a valve or the last cycles to close it. During travel the valve torque usually drops considerably and the lower 1:1 ratio can be employed to reduce the number of input turns required. Typically this can provide a 70% reduction in the number of turns required and the operating time.
- 5.2 Peripheral rim pull which would produce in excess of 1.5x the rated valve torque should be avoided as this could cause the handwheel drive pin to fail with subsequent loss of flow control.
- 5.3 Should the need arise to secure the valve in any position, additional padlocking kits are available, but not supplied as standard.

6. Maintenance

- 6.1 The DSIR gearboxes are supplied grease filled and are sealed for the intended life of the product. Subsequently, no regular maintenance is required during normal life.
- 6.2 During extended life periods, if any faults develop the gearbox should be returned to Rotork for service.
- 6.4 Cleaning should be performed using a mild detergent.