

## Downhole Safety Valve (DHSV)

The Expro DHSV is a single shot ball valve run in the open position and is typically used in HP/HT or gas well applications, and/or when policy requires a secondary downhole barrier to be deployed. If required, the ball can be closed by applying annulus pressure to burst a pre-selected rupture disk. Once closed the ball will isolate the well pressure but will still allow fluid to be pumped through from the tubing above.

### Specifications:

Working pressure		15,000 psi / 103.42 Mpa
Working temperature <sup>1</sup>		350°F / 177°C
Differential pressure below ball		15,000 psi / 103.42 Mpa
Max. OD		5.00 in / 127 mm
Min. ID		2.25 in / 57.2 mm
Upper thread connection	standard (premium)	3 1/2-in. API IF box (3 1/2-in PH6 box)
Lower thread connection	standard (premium)	3 1/2-in. API IF pin (3 1/2-in PH6 pin)
Tensile strength		50,000 lbf / 155,600daN
Torque strength		10,000 ft-lbs / 13,550 N m
Make-up torques	service breaks	4,000 ft-lbs / 5,420 N m
	tool connection <sup>2</sup>	6,000 ft-lbs / 8,130 N m
Tool length <sup>3</sup>		7.79 ft / 2.374 m
Approximate tool weight		300 lbs / 136 kg
Service <sup>4</sup>		H <sub>2</sub> S per NACE MR-01-75; CO <sub>2</sub>

1. Standard seal trim. Premium seal trim for 15,000 psi (103.42 MPa) up to 450°F (232°C)
2. Torque for standard connections. See manufacturer's recommendation for premium connections
3. Make-up length (shoulder-to-shoulder)
4. CO<sub>2</sub> and acid tolerant. Limits determined by application

### Operation:

The DHSV is closed by applying pressure to the annulus to burst a high accuracy rupture disk. Rupture disk selection is based on annulus fluid hydrostatic pressure at tool setting depth, plus the desired surface applied pressure to operate the tool. The rupture disk has an accuracy of +/- 2% on a nominal burst value corrected for bottom hole temperature. On the disk bursting, a path is opened into an atmospheric chamber allowing annulus pressure to force the operating mandrel in an upward direction, rotating the ball to the closed position. The ball cannot be reopened but will not support differential pressure from above, allowing the well to be killed by bullheading kill fluid to the formation. The pump-through pressure is a function of annulus fluid hydrostatic and differential pressure across the ball.

