

## INTERLOCKS

As a general principle it may be said that operations which are safe when performed correctly can have catastrophic consequences when performed incorrectly. The Oil & Gas and Chemical processing industries generally have a disciplined approach to design and operating practice - usually governed by well recognised international standards and enforced by regulatory authorities and certification bodies. While good practice begins with good design - both are ultimately hostage to the 'Human Factor'.

Modern process plants are highly automated and regulated by distributed software management systems which are simply monitored by 'Production' personnel - often remote from the physical location of the plant itself. Indeed, some operations such as pig launching or receiving procedures can be effected in semi-automatic mode using push button controls (again often from a remote station).

Maintenance procedures however invariably involve human intervention and interrupt automated processes creating 'abnormal' conditions for the duration of the work. Loading or unloading of pig traps, changeover of pressure relief valves, turbine servicing (requiring suspension of CO2 Fire Deluge), coupling or uncoupling of hoses for loading or discharge of tanker cargoes all involve human intervention and are hostage to the possibility of operator error. Distributed control systems (DCS) cannot effectively regulate such (maintenance) procedures - the SFC 'Coded Card Key Interlock System' can!



## FLEXI-DRIVE

Unique cable drive system that has revolutionised the placement of valves and the particular difficulty in operating them in confined spaces.

In a hazardous area, below water, in a confined space, in a pit, where noxious fugitive emissions prevail or just plain out of reach, **Flex<sup>Drive</sup>** is the answer.

**Flex<sup>Drive</sup>** is a very versatile product consisting of two stations, joined by a unique patented linear drive cable. This equipment enables valves and other wheel-operated devices in remote, hard to reach or hazardous locations to be operated easily from a conveniently located handwheel.

Developed to operate valves in inaccessible locations, **Flex<sup>Drive</sup>** can be applied to any conventional wheel-operated valve/device, in oil, gas and chemical processing plants, or any other industrial application. It is suitable for underwater use and will function reliably in all climatic conditions.

The cable system can deliver adequate torque output for most manual valve situations and can transmit drive to a valve up to 60 metres from the operator station. The flexible cable system facilitates up to 540 degree of bends in a cable run.

### ■ Operation

---



[Click here to download the animation \(large file\)](#)

#### 1. Operator Station Actuator

Operator Station are available in a variety of different gear ratios, providing a wide range of torque capabilities. A helically wound steel cable has a pitch the same as that of cable gear. The precision gear-cable interface provides a positive force to the helix cable, which travels through flexible conduit to the valve station actuator.

- a unique valve cable drive system for the oil and gas, petrochemicals, marine, water, and power industries.

## Material Spec

- 316 Body Casting
- PB1 Bronze Bearings
- IP65 Rating
- Capability Over 60 Metres
- Can Accommodate 540 Bends
- Cable Bend Radius 300mm
- High Torque Capacity
- Totally Maintenance Free
- Adaptable To Any Conventional Valve

The cable system can be passed around and through walls, bulkheads, floor and any other obstacles to reach the host valve.

## EASI-DRIVE

Easi-Drive is a fully portable, lightweight and adaptable tool available in electric, pneumatic and battery powered modes. The tool's reaction device protects the operator from the "kick" normally associated with a torque wrench. Easi-Drive also features a variable output torque adjustment, available in various sizes of maximum output from 350 to 8,500 foot pounds. Unlike an impact wrench, which could damage a valve, the Easi-Drive is a continuous drive system.

Three simple steps to easi-drive installation and use:

1. Decide if you want to retain the option of manual valve operation via the handwheel.
- 2 Install the relevant easi-drive equipment.
- 3 Connect drive gun to power supply (pneumatic, electric or hydraulic).

SFC **Flex**Drive system comprise of four basic elements:

1. Operator Station Actuator
2. Helical Drive Cable
3. Valve Station Actuator
4. Valve Drive Coupling  
(designed to suit the host equipment)





Typical gearoperated gate valve, pneumatically driven using a 'universal', bolt-on handwheel drive plate and reaction device.



Typical gear-operated ball valve, pneumatically driven direct to the gearbox input shaft - fork type reaction device shown.



**Pneumatic Tool**

Easi-Drive is an efficient and cost-effective alternative to a dedicated actuator. Wherever you have manually-operated valves that have high operating torques, hundreds of handwheel turns to open/close or are just difficult to operate then easi-drive is your solution.

### ■ Product Features

---

Each drive tool has a unique serial number and is supplied with it's corresponding certificate of calibration. The example provided shows the relationship between the input air supply pressure, via the SFC air filter, regulator and Lubro (FRL) pack and the output torque that the drive tool can produce.

By adjusting the air pressure you can easily restrict the torque output of the drive tool for your precise requirements.

### ■ Option

---



## **Wastewater treatment plant can operate valves in event of power outage.**

The Easi-Drive portable valve actuator from Smith Flow Control provides wastewater treatment plants with emergency operation of valves in the event of a power failure. Easi-Drive can open or close electric actuated valves during a power outage to protect against overflows. In the event of an outage, an operator can use Easi-Drive powered by an electric generator to make the required valve movements until power is restored.

Easi-Drive is a fully portable, lightweight and adaptable tool available in electric, pneumatic and battery powered modes. Suitable for all hazardous areas, Easi-Drive reduces work crew tasks down to one-man operation and eliminates operator fatigue and risk of injury. The tool's reaction device protects the operator from the "kick" normally associated with a torque wrench. Easi-Drive also features a variable output torque adjustment, available in various sizes of maximum output from 350 to 8,500 foot pounds. Unlike an impact wrench, which could damage a valve, the Easi-Drive is a continuous drive system.

Smith Flow Control (SFC) was established in 1985 to provide engineered safety systems for hazardous valve operations. Most offshore installations in the North Sea have been equipped with SFC systems as well as the majority of related onshore processing facilities throughout Europe. By 1990 SFC became the generic term for key interlock safety systems in the international Oil & Gas industry and its client base now includes most of the major operating companies across all five continents. For over 20 years, Smith Flow control has never failed to provide a viable technical solution to a client's safety operating problem.

