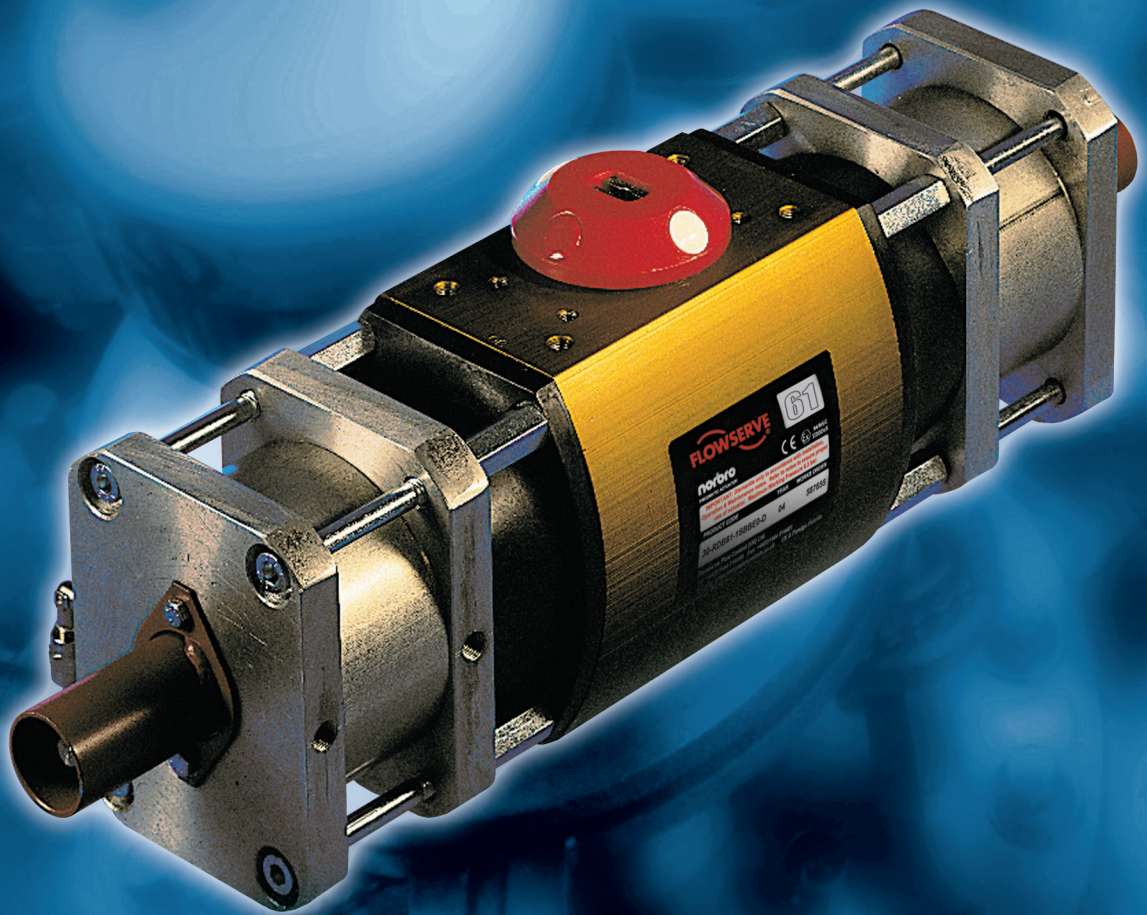




## *Norbro 61 Series Two Stage Actuator*



*Experience In Motion*

## Norbro 61 Series

The Norbro 61 Series brings new levels of control to batch/filling operations. It has been designed specifically to provide rapid, repeatable and highly accurate filling control for all weigh/measuring processes. The 61 Series is suitable for applications in either fully automatic or manual systems, and can be used with any quarter turn valve.

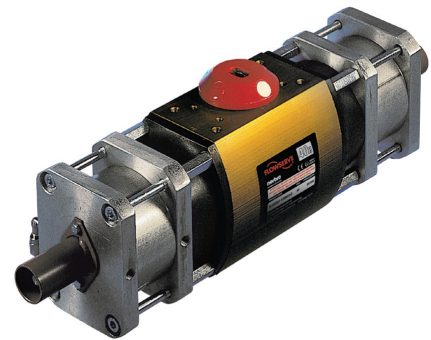
The design has been extensively field-tested and is based on Norbro's world-renowned Series 40R pneumatic actuator, sizes 10-35.

In automatic mode, the 61 Series requires a batch meter with two staged signal capacity. Mounted conventionally on typical quarter turn filling valves, the actuator provides either "full flow", "trickle" or "shut-off" conditions in accordance with the meter signal.

### Principle of Operation (Spring Return Version Illustrated)

The centre section of the 61 Series is a standard Norbro 40R pneumatic actuator which houses the primary piston rack and pinion mechanism responsible for actuating the valve. This is controlled by solenoid valve SV1 (normally closed).

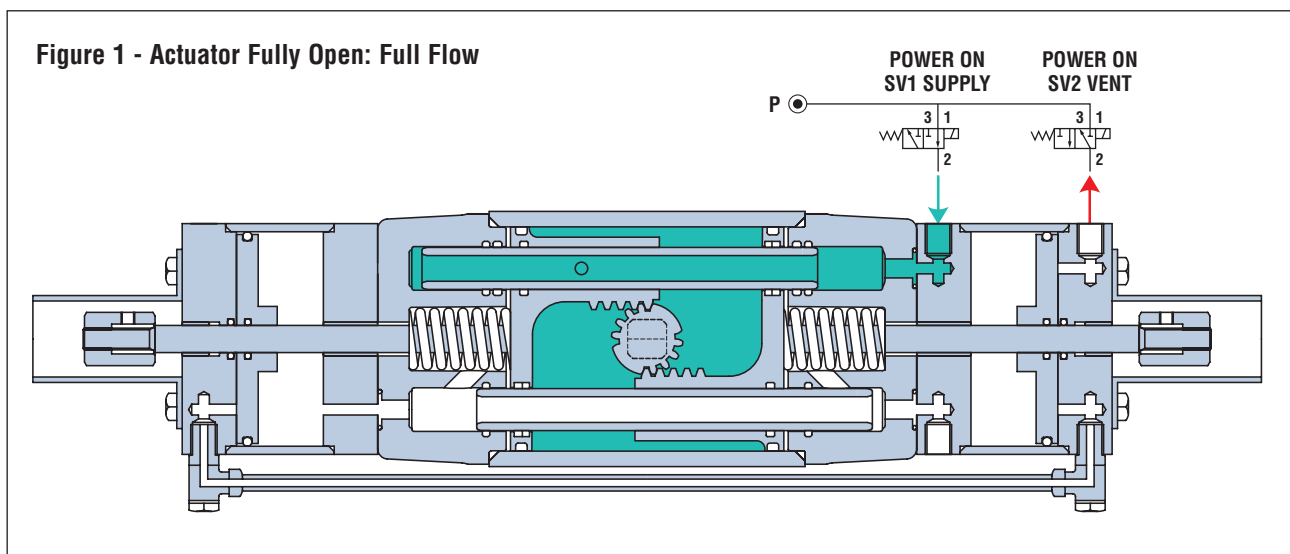
In addition, an auxiliary cylinder, fitted with secondary piston and double-ended push rod assembly, has been added to each end of the actuator. These two auxiliary cylinders are pneumatically interconnected and are controlled by solenoid valve SV2 (normally open). The piston rod ends enter the actuator through seals in each end-cap, whilst the outer ends of each rod emerge externally and are threaded and fitted with adjustable 'stop' nuts. A bolted on cover sleeve serves as both safety and operator interference guard.



## STAGE 1 - FULL FLOW

At the start of the filling operation both solenoids are energised. Solenoid valve SV1 admits air to the actuator to push the pistons apart, thereby opening the actuator/valve (and compressing the return spring).

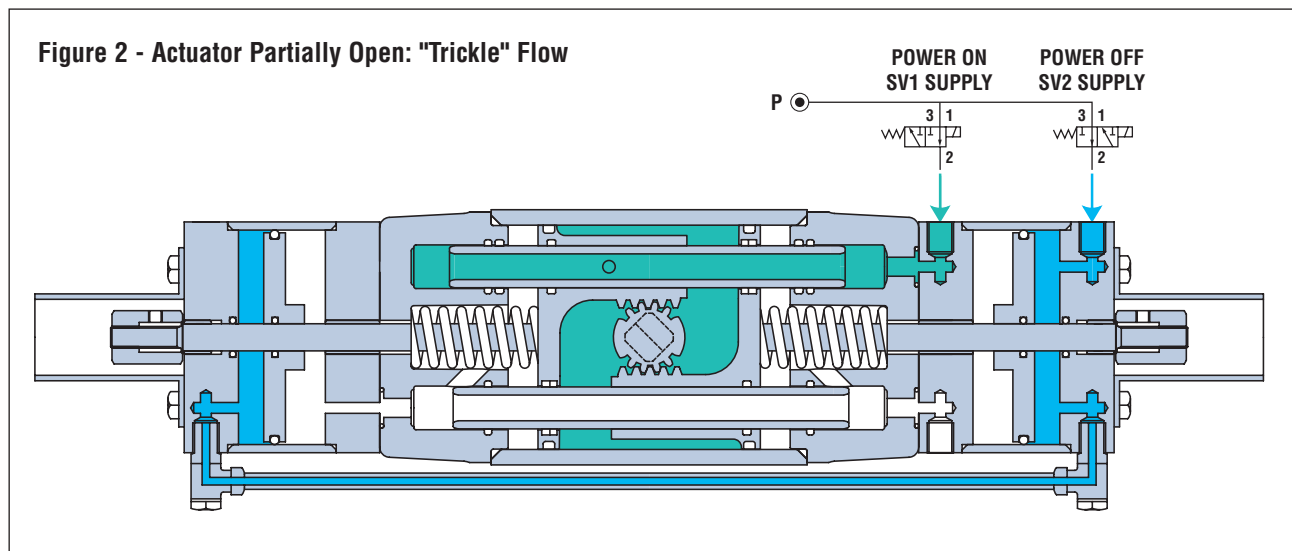
Simultaneously solenoid valve SV2 releases pressure from the auxiliary cylinders, allowing the working pistons to push the secondary pistons fully out via the push rods. The system will now be filling at full open valve rate - 'coarse fill' (see Figure 1).



## STAGE 2 - TRICKLE FLOW

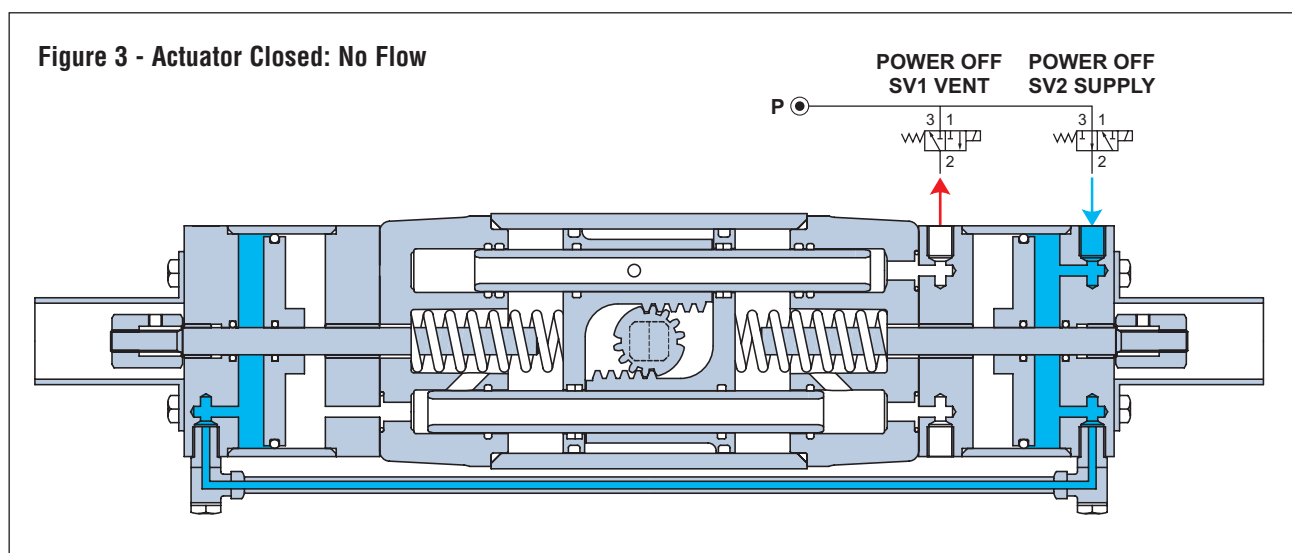
When the preset value of 'coarse fill' is reached, the first signal switches off - i.e. SV2. This causes the auxiliary cylinders to be pressurised forcing the secondary pistons and push rods against the primary pistons, which part closes the actuator (against the air pressure, but spring assisted) to a position determined by the adjustable stops (see Figure 2).

In practice, a 20% open valve is typical for this 'fine fill' stage. This intermediate position is reproduced both accurately and rapidly on every operation.

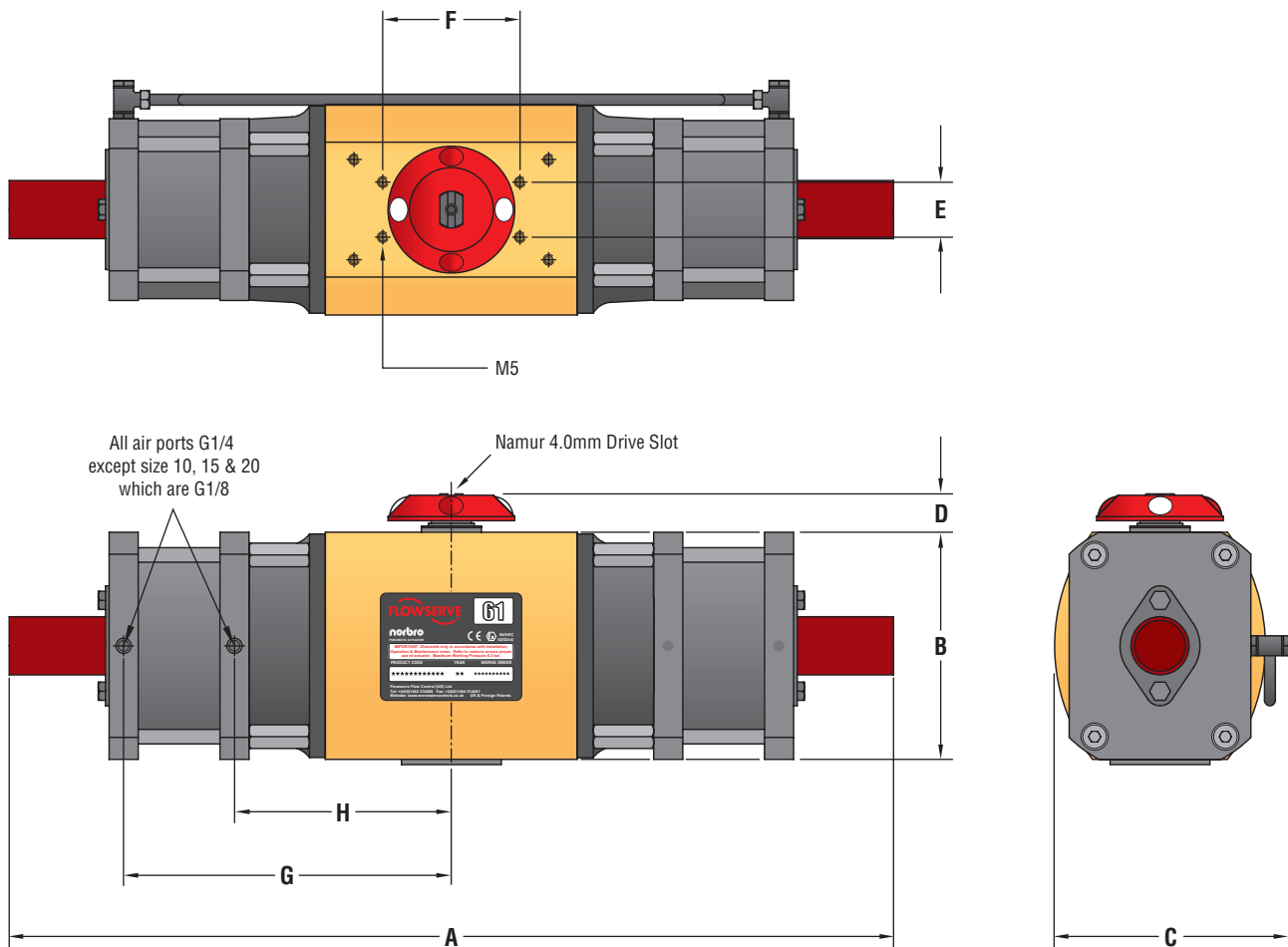


## STAGE 3 - SHUT-OFF

Immediately the final preset value is reached, the 'fine fill' signal switches off - i.e. SV1. Air is exhausted from the centre chamber and the actuator closes by spring force which shuts off the valve. Adjustment can be accurately maintained to allow for 'in-flight' media at the time of switch-off (see Figure 3).



**PLEASE NOTE:** Specification does not include solenoid valve SV1 and SV2.



### Dimensions (mm)

Series-Size	Length A	Height B	Width C	D	VDI/VDE 3845		G	H
					E	F		
10-61	378	86	95	20	30	80	138	85
15-61	431	104	112	20	30	80	154	98
20-61	493	125	130	20	30	80	180	119
25-61	572	147	157	30	30	80	216	141
30-61	677	168	175	30	30	80	257	168
33-61	747	214	215	30	30	80	294	143
35-61	809	217	234	30	30	80	349	218

FCD NBEBR0004-01 Printed in UK.

Due to continuous development of our product range, we reserve the right to alter the dimensions and information contained in this leaflet as required. Information given in this leaflet is made in good faith and based upon specific testing but does not, however, constitute a guarantee.



**Flowserve Flow Control (UK) Ltd.**  
 Worcester Controls  
 Burrell Road, Haywards Heath  
 West Sussex RH16 1TL  
 United Kingdom  
 Telephone: +44 (0)1444 314400  
 Telefax: +44 (0)1444 314401  
 Email: [wwukinfo@flowserve.com](mailto:wwukinfo@flowserve.com)