

# Solenoid Operated Safety Cut-Off Valve Series 304



## PRODUCT INFORMATION

**Serving the Gas Industry  
Worldwide**



## SOLENOID OPERATED SAFETY CUT-OFF VALVE SERIES 304

Introduction, Application, Features, Technical Data

### Introduction

- The Series 304 Solenoid Operated Safety Cut-Off Valve - is a single in line orifice design with hinged door, electrically operated, with 24 Volt DC Solenoid, manual reset door, with integral push and hold pressure equalising bypass.
- Use with confidence on natural and manufactured gases of non-aggressive nature, including Nitrogen, Carbon Dioxide, Propane and Butane.

### Application

- Designed to safeguard gas distribution systems, normally installed upstream of the regulator. Closes automatically in the event of temporary interruption of the power supply to the solenoid.
- After closure, indicated by remote indication (optional), the slam shut must be manually reset to the open position after normal conditions have been restored and if necessary pressure differential across valve door has been equalised by the use of the manual 'push and hold' pressure equalising bypass valve and the power supply to the solenoid has been restored.

SERVICE CONDITIONS			
Model	Size	Maximum Working Pressure	Temperature Range
304/05	DN 50	16 barg	-5°C to +60°C
	DN 80		
	DN 100		
	DN 150 DN 200		
304/03	DN 250	7 barg	
	DN 300		

DI = Ductile Iron

### Size Range

DN 50  
DN 80  
DN 100  
DN 150  
DN 200  
DN 250  
DN 300

Flanged connections to:  
PN16: BS EN 1092-2 : 1997

### Features

- Instantaneous closure of valve door (0.5 secs.), upon temporary interruption of power to the solenoid.
- Helical Torsion Spring(s) secures door in closed position.
- Integral push button pressure equalising valve.
- Manual reset
- Specially designed spindle and 'O' Ring seal between trigger mechanism and solenoid actuator.
- Low pressure loss.
- Cartridge construction
- Reset & By-Pass: Mounted on Right Hand side of body when looking on inlet.

### Options

Can be supplied with Proximity Sensor System (Pepperl and Fuchs PTB approved) or Tilt Switch, to initiate 'valve-open' or 'valve-closed' indicator on remote panel.

Reset & By-Pass mounted to Left Hand side of body when looking on inlet.

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Pressure Loss, Technical Details

### Pressure Loss

The Series 304 is designed for minimal pressure loss ( $\Delta P$ ).

$$\Delta P = \frac{P_i - \sqrt{P_i^2 - 4(Q/K)^2}}{2} \text{ bar}$$

Where:

$P_i$  = Inlet Pressure bar (abs)

$P_o$  = Outlet Pressure bar (abs)

$Q$  = Valve flow  $M^3/hr$  (SG 0.6)

$K$  = Flow Constant

(abs) = Absolute pressure 1.01325

VALVE CONSTANT	
Valve Size	Flow Constant
DN 50	3860
DN 80	7861
DN 100	16302
DN 150	49780
DN 200	78818
DN 250	102675
DN 300	176600

### Conversion Factor

The pressure loss calculation is given in terms of natural gas (SG 0.6). For all other gases multiply by the following correction factor

$$\sqrt{\frac{0.6}{\text{SG of Gas handled}}}$$

Conversion to  $ft^3/hr$  - multiply by 35.3

SOLENOID DETAILS		
	304/05	304/03
Supply Volts DC	24 Volts DC min. 21.6 Volts max. 25.2 Volts	24 Volts DC min. 21.6 Volts max. 25.2 Volts
Power Consumption $P_{20}$ (20 degs C coil temperature)	36.5 Watts	66.2 Watts
Rated Current (In)	1.52 Amps	2.76 Amps
Closing Time*	0.5 secs	0.5 secs
Electrical Connection and Protection	DIN VDE 0470/EN 60529 IP 54 and VDE 0171 (Ex) s G4	

\* Slam Shut Door closure time from loss of power supply

DC Flameproof High Duty Solenoid, Atex Approved.

Class F coil insulation wound with a 100% Duty Rating

### Installation

For use in the horizontal position only with solenoid vertically upwards and the valve body must be aligned with the gas flow direction as indicated by the arrow cast on the side of the valve body.

It is important when installing equipment that pipeline stresses are kept to a minimum and no undue external forces are placed on the connections.

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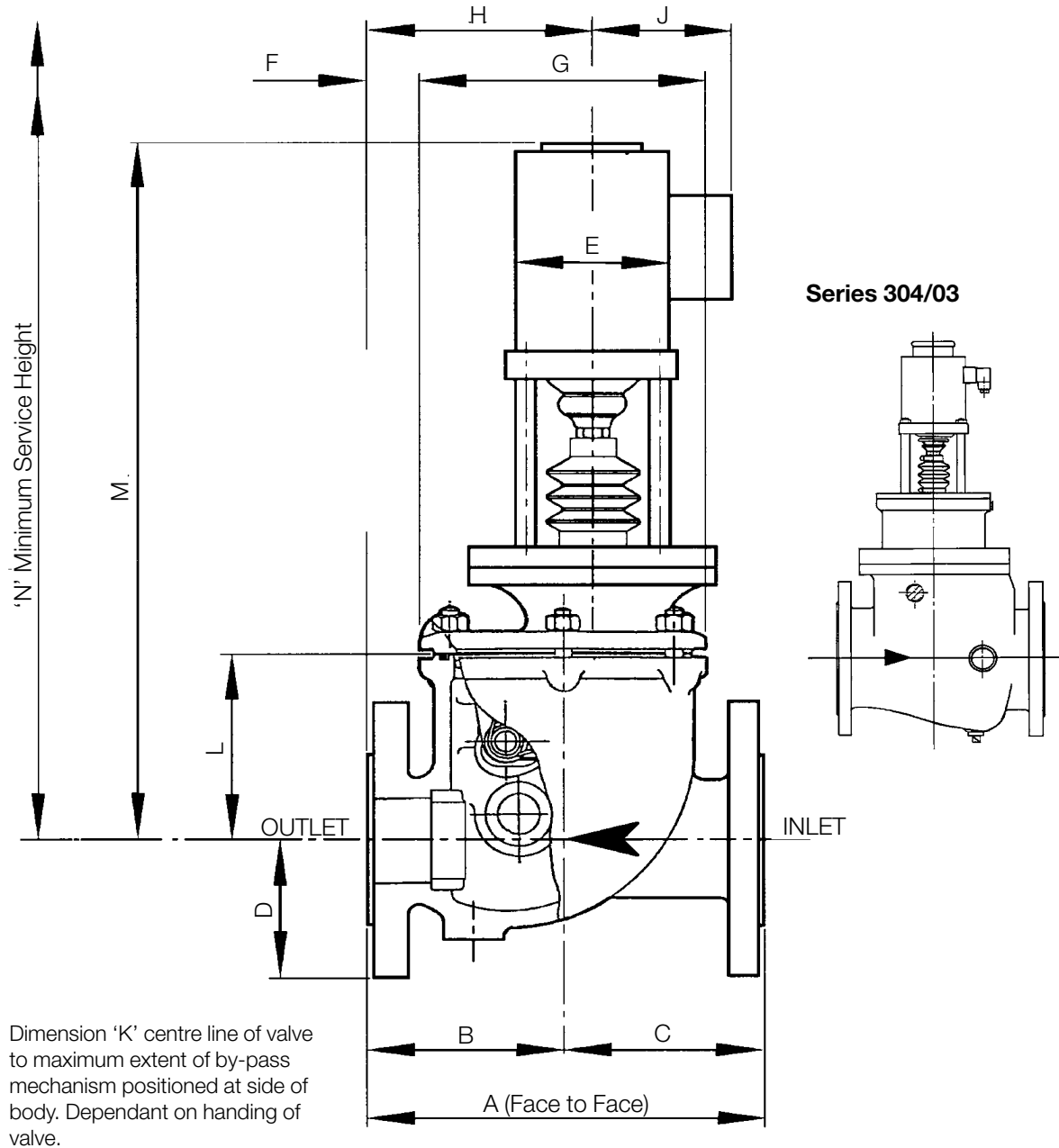
### Materials of Construction

MATERIALS OF CONSTRUCTION	
<b>Series 304/05</b>	
Valve Body and Top Cover	Ductile Iron to BS EN1563 Grade EN-GJS-400-18
Ball Cage and Trigger Housing and Trigger Spindle	Steel to FV25144D/4S100
Orifice	Stainless steel to BS 970 316S16
Door (304/05) Sizes: DN 50, DN 80 & DN 100 mm Sizes: DN 150 and DN 200 mm	Aluminium to BS 1474 HE 30 TF Mild Steel Plate to BS 4360 Gr43A Zn plated.
Door Seating	Polyurethane seat 60/65 alt 70/75 IRHD
Bypass Spindle, Reset Spindle, Upper Spindle Collar and Trigger Pivot Pin	Stainless Steel to BS970 416S21
Bypass/Reset Retaining Nuts	Brass to BS2874 CZ 121
Actuator Spring	Spring Steel to BS 5216 Gr HS3
Door Torsion Springs (RH/LH) and Trigger Spring	Stainless Steel to BS 970 302S25
Door Arm Sizes: DN 50, DN 80 & DN 100 mm Sizes: DN 150 and DN 200 mm	Stainless Steel Type 304 Mild Steel Zn plated
Trigger Sizes: DN 50, DN 80 & DN 100 mm Sizes: DN 150 and DN 200 mm	Brass to BS2872 CZ115 Stainless Steel BS 1449 304S12
Trigger Bush, Spherical Washer, Arm Bush and Spring Bush	Nylon 11 Rilsan BMNY
By-pass cap	Aluminium to BS 4300/5 FC1
Balls	Non-corrodible steel to AISI 440 C
'O' Rings (all)	Nitrile
Setscrews, Studs and Nuts	Carbon Steel
Spindle Thrust Washers - sizes: DN 150 and DN 200 only	Nylatron GS
Bellows	Neoprene
Solenoid mounting plate	Mild Steel Plate to BS 4360 Gr 43A
Solenoid Support legs	Stainless Steel to BS970 416S21
<b>Series 304/03</b>	
Valve Body and Top Cover	Ductile Iron to: BSEN 1563, Grade EN-GJS-400-18
Trigger Spindle and Spacers	Stainless steel to BS 970 316S16
Orifice	Stainless steel to BS 970 316S16
Door (304/03) Sizes: DN 250, & DN 300	Carbon Steel Zn Plated
Door Seating	Polyurethane seat 60/65 alt 70/75 IRHD
By-pass Spindle	Stainless Steel to BS970 416S21
Actuator Spring	Spring Steel to BS 5216 Gr HS3
Door Torsion Springs	Spring Steel to BS 5216 Gr HS3
'O' Rings (all)	Nitrile
Setscrews, Studs and Nuts	Carbon Steel
Bellows	Neoprene
Solenoid mounting plate	Mild Steel Plate to BS 4360 Gr 43A
Solenoid Support legs	Stainless Steel to BS970 416S21

## SOLENOID OPERATED SAFETY CUT-OFF VALVE SERIES 304

### Dimensions & Weights

#### Series 304/05



#### DIMENSIONS & WEIGHTS

Size	A	B	C	D	E	F	G	H	J	K	L	M	N	WT.Kg
DN 50	230	117	113	85	90	33	168	136	120	131	110	365	470	28
DN 80	276	146	130	100	90	38	208	169	120	135	126	381	501	36
DN 100	292	146	146	130	90	38	208	169	120	135	137	392	527	40
DN 150	381	203	178	147	90	66	273	203	120	185	178	640	700	82
DN 200	457	247	210	175	90	82	330	247	120	210	216	710	770	115
DN 250	533	292	241	203	120	89	406	-	135	280	280	780	880	185
DN 300	609	330	279	230	120	86	489	-	135	310	318	840	940	250

All Dimensions in mm